DISSERTATION
ON
"A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMONG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHENNAI".

MSc (NURSING) DEGREE EXAMINATION
BRANCH –IV COMMUNITY HEALTH NURSING

COLLEGE OF NURSING
MADRAS MEDICAL COLLEGE, CHENNAI – 600003.

A dissertation submitted to

THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY,

CHENNAI – 600 032.

In partial fulfillment of requirements for the degree of

MASTER OF SCIENCE IN NURSING

APRIL 2016

CERTIFICATE

This is to certify that this dissertation titled **" Assess the effectiveness of Holy Basil Leaves Extract in reducing blood sugar among diabetes mellitus clients in selected urban area at Chennai"**is a bonafide work done by **Mrs.Jeganathan Rajeswari , II Year, MSc (N) Student,** College of Nursing, Madras Medical College, Chennai – 600003 submitted to **The Tamilnadu Dr.M.G.R. Medical University, Chennai-32,** in Partial fulfillment of the requirements for the award of Degree of **Master of Science in Nursing, Branch - IV, Community Health Nursing** under our guidance and supervision during the academic period from **2014 – 2016**.

DR. MS. V.KUMARI, M.Sc (N), Ph.D,

Principal,
College of Nursing,
Madras Medical College,
Chennai-03.

DR.R.VIMALA, MD.,

Dean,
Madras Medical College,
Rajiv Gandhi Govt. General Hospital,
Chennai-03.

"A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMONG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHENNAI ".

Approved by the Dissertation committee on 21.10. 2015

RESEARCH GUIDE

Dr.V. KUMARI, M.Sc (N), Ph.D,
Principal,
College of Nursing, Madras Medical College,
Chennai-03

CLINICAL SPECIALITY GUIDE

Mrs .J.S. Elizabeth Kalavathy, M.Sc ((N),
Reader, Department of Community Health Nursing,
College of Nursing, Madras Medical College,
Chennai-03

MEDICAL EXPERT

Dr.Joy Patricia Pushparani, M D
Director,
Institute of Community Medicine,
Madras Medical College,
Chennai-03.

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ACKNOWLEDGEMENT

"Perfection is not attainable, but if we chase perfection we can catch excellence"

-Vince Lowbardi

Acquire the grateful habit, learn to see how blest you are. Nothing concrete can be achieved without an optimal inspiration during the course of work. There are several hands and hearts behind this work to bring it to this final shape for which I would like to express my gratitude. Great and mighty is our Lord our God, to whom all thanks and praise for all wisdom, knowledge, guidance and strength throughout this work.

I wish to acknowledge my sincere and heartfelt gratitude to the almighty God for this marvelous grace shown from the beginning to the end of the study

The encouragement is a booster of the human life without this no one can achieve easily. I thank everyone encouraged me to achieve to complete this task effectively.

.I wish to express my sincere thanks to Prof**. Dr.R.Vimala, MD**, Dean, Madras Medical College, Chennai for providing necessary facilities and extending support to conduct this study.

I am more privileged to thank **Dr.R.Lakshmi, MSc(N).,Ph.D., ADME.,(Nursing)** for her continuous support, expert guidance and encouragement of this study during her presence in our college.

I express my heartfelt thanks to **Dr.V.Kumari, MSc (N)., Ph.D.,** Principal, College of Nursing, Madras Medical College, Chennai for her continuous support, constant encouragement and valuable suggestions helped in the fruitful outcome of this study

I deem it a great privilege to express my sincere gratitude and deep sense of indebtedness to my esteemed teacher **Ms.J.S.Elizabeth Kalavathy, MSc (N).,** Reader, College of Nursing, Madras Medical College, Chennai for her timely assistance and guidance in pursuing the study.

I thank **Dr.Joy Patricia Pushparani, M.D,** Director, Institute of Community Medicine, Madras Medical College, Chennai-3 for the Support and assistance given by them according to their possible manner to complete this study.

I wish to express my special heartfelt thanks and sincere gratitude to **Dr. N.A Senthil Nathan. M. B. B. S, D.P.H,** City Health officer, Public health department, Corporation of Chennai for granting permission to conduct the study in Choolai (Urban) Community area.

I extend my sincere thanks to **Mr.Padmanaban M.Sc., (Statistics),** Scientist B(Non Medical), NIRRH Field unit, ICMR, KMC Hospital. for suggestion and guidance on statistical analysis. It is my immense pleasure and privilege to express my gratitude to **Mrs. Ebi GoldaMary, M.Sc (N),** Reader, Community Health Nursing, Madha College of Nursing, Kundrathur for validating this tool.

I wish to express my gratitude **Dr. Devi priya, M.B.B.S,** Medical officer Choolai health post.

I wish to express my gratitude to **Mrs.G.Shanthi, M.Sc(N)., Mrs.L.Shanthi, M.Sc(N).,** Lecturers and to all the **Faculty Members** of College of Nursing, Madras Medical College for their valuable guidance in conducting this study.

I extend my thanks to **Mr. Ravi, B. A, B.L.I.Sc.**, Librarian, College of Nursing, Madras Medical College, Chennai-3 for his co-operation and assistance which built the sound knowledge for this study.

I am grateful to all my family members, classmates and my friends for their support, interest, encouragement as well as prayers, thereby making me taste success in all the difficulties faced during the study. My heartfelt thanks to all **clients participating** in this study, residing in Choolai urban community area in Chennai, for their fullest cooperation.

Once again, I thank **the Lord Almighty** for his blessings, wisdoms and direction. Finally, my whole hearted thanks and gratitude to one and all, that helped me on my way to success.

ABSTRACT

TITLE

A study to assess the effectiveness of holy basil leaves extract in reducing blood sugar among diabetes mellitus clients in selected urban area at Choolai , Chennai

Diabetes is a disease which needs lifelong treatment. Left untreated or improperly treated, it shortens life considerably or debases its quality substantially.

Need for study : They can be largely avoided by taking simple precautions and proper control of the disease which would certainly make it possible to lead a normal, active and healthy life.

Objectives : The main aim of the study was to evaluate the effectiveness of holy basil leaves in reducing the blood sugar level among the Type II Diabetic patients residing at urban areas of Choolai, Chennai

Methodology:

Research approach : Quantitative Approach

Research design :Experimental design, pre test, post test design. The conceptual frame work used for this study modified Model of King Goal Attainment Nursing Theory The present study was an experimental study.

Population : The target population of the study are the clients (Male and Female) with Type II Diabetes Mellitus between 40-60 years of age..

Sampling technique : The research design was pre-test post-test control design.

Sample size : The sample size comprises of 60 clients with Type II Diabetes Mellitus. (30 Control group, 30 Experimental group)

Data collection procedure : By using simple random sampling technique 60 type-II diabetic clients between 40-60 years of age were selected (30 in experimental group and 30 in control group) as study samples. The tool developed and used for data collection was structured interview and observation schedule. Pre test Fasting blood sugar was measured in experimental and control group before intervention. 50 ml of holy basil leaves extract was given to experimental group for 15 days daily in the morning after breakfast by the researcher in person. Post Test Fasting blood sugar levels were assessed using glucometer.

Data analysis : The Data were analysed by Descriptive analysis such as mean, standard deviation, Frequency and percentage for demographic variables and Inferential analysis like chi- square test, paired t – test, independent t – test were used to analyse clinical variables.

Study results : The pre and post assessment of blood sugar level in experimental group the result shows that the mean value of pre test is 172.27 and post test is 140.23 . In the difference of mean value (32.033) and SD (11.467) value there is increase of 11.467 SD value when comparing the pre and post test blood sugar level .t=15.301 with df=29 and the p value is 0.000 it is statistically significant.

Discussion: The mean blood sugar level of experimental group is 172.27 in pre test and 140.23 in post test .The mean difference is 32.04. but in the control group the mean difference is only 1.94 with 95% CI. (t= 15.301,P =0.001) . Hence the hypothesis was proved.

Conclusion : Thus the investigator conclude that there is a effectiveness of holy basil leaves extract in reducing the Blood sugar among Type II Diabetic client which is statistically proved (p= 0.001).

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LIST OF ABBREVIATION

S. NO	ABBREVIATION	EXPANSION
1	DM	Diabetes Mellitus
2	IDDM	Insulin-Dependent Diabetes Mellitus
3	NIDDM	Non Insulin-Dependent Diabetes Mellitus
4	IDF	International Diabetes Federation
5	CVA	Cerebro Vascular accidents
6	GDM	Gestational Diabetes Mellitus
7	BMI	Body Mass Index
8	WHO	World Health Organization
9	r	Correlation coefficient
10	H	Hypothesis
11	X^2	Chi square test
12	CI	Confidence interval
13	P	Probability level
14	N	Number of subjects
15	SD	Standard deviation

CHAPTER I

I AM NOT ILL , MY PANCREAS IS JUST LAZY.

SIMSON RUTH

INTRODUCTION

Diabetes presents a significant public health burden on the basis of its increased morbidity, mortality, and economic costs. Every fifth person who suffers from diabetes mellitus in the world today is an Indian. Out of total number of person suffering from diabetes mellitus in the world which is around 150 million roughly, 135 are Indians. Individuals with diagnosed diabetes are at an increased risk for vascular disease, including micro vascular complications (e.g., retinopathy, neuropathy, and nephropathy) and macro vascular complications (egg, coronary heart disease and stroke), and lower extremity amputations.

Improved glycaemia control clearly reduces the risk of micro vascular disease among individuals with diagnosed diabetes and is associated with lower risk of atherosclerosis and macro vascular disease. Treatment for individuals with diabetes has traditionally focused on control of glycaemia to reduce these vascular complications.

The long–term effects of diabetes mellitus include progressive development of the specific complications of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcers, amputation, Charcot joints, and features of autonomic dysfunction, including sexual dysfunction.

People with pre-diabetes are advised to change their diets to control their blood sugar levels. Herbal extracts, teas and powders have been used for a long time to treat pre-diabetes and diabetes. They are thought to work in a number of different ways to help normalise blood sugar levels, including by improving

pancreatic function and increasing the availability of insulin, a hormone that regulates blood sugar levels.

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world.

Alternative medicine along with reduced dosage of allopathic medicines can produce a better control on the effect of fasting blood sugar. Since allopathic medicines have more side effects compared to alternative medicine, and alternative medicine is advantageous in terms of the affordability and feasibility. Hence alternative medicine plays a vital role in the better control of the blood sugar. Alternative medicine also emphasis in improving the quality of life be it treatment of diseases or promoting well-being of the individual.

Holy basil is a relative of the more familiar species used in cooking. Known to the Ayurvedic medical tradition as tulsi, it has been called the “Queen of Herbs” since the times of ancient civilization in India.Ayurvedic tradition classifies tulsi as an adaptogenic herb, capable of increasing the body’s resistance to stress and disease. Its many specific uses have included coughs, colds, and other respiratory disorders, fevers, headaches, stomach disorders, and heart disease.

The stem and leaves of holy basil contain a variety of constituents that may have biological activity, including saponins, flavonoids, triterpenoids, and tannins. The leaf also contains an essential oil composed of eugenol and other volatile compounds. Several of these constituents have antioxidant and anti-inflammatory properties according to test tube studies.

The extracts of holy basil leaf have also lowered blood sugar, reduced some measures of the response to physical stresses, recent trends and current innovations

create a very good opinion on alternative therapy and Indian medicines, so the investigator took this study to assess the effectiveness of holy basil leaves extract on lowering blood sugar level.

1.1 Need for the study

According to the WHO estimates, India had 32 million diabetic subjects in the year 2000 and this number would increase to 80 million by the year 2030. The International Diabetes Federation (IDF) also reported that the total number of diabetic subjects in India is 41 million in 2006 and that this would rise to 70 million by the year 2025.

Table 1.1 : Prevalence of Diabetes (WHO-2014)

ountry	n 2000-2014	n 2030
frica	,71,000,000-366 Million	,66,000,000-552Million
merica	3,016,000-29.1million	6,812,000-366millon
urope	3,332,000-385millon	7,973,000-438million
ndia	1,705,000-171million	9,441,000-366million

The prevalence rate is higher in men than women, but there are more women with diabetes than men .The prevalence rate of diabetes mellitus in our country is 1 to 2% comprising of urban population ranging from 0.95% to 3.8% while the rural population ranging from 0.60% to 1.93%.

Prevalence of diabetes increased by 39.8% (8.3–11.6%) from 1989 to 1995; by 16.3% (11.6–13.5%) between 1995 and 2000; and by 6.0(13.5–14.3%) between 2000 and 2004 in Tamilnadu.

According to the urban health post of Choolai report statement there are 535 peoples are suffered with Diabetic mellitus and undergone allopathy treatment. In that total diabetic population 58.4% (312) female and 48.6% (223) male are suffered with diabetic .

Diabetes mellitus is a major problem and effective management of Blood sugars is a major task. Alternative medicine has various advantages in term of affordability and availability, less side effects, not being addicted to prescribed

drugs, the amount of medicines. Alternative medicine excels in the treatment of chronic diseases. It also believes in gentle, long-term support to enable the body's own innate powers to do the healing.

The research is carried out in order to support the other studies suggesting the combination of alternative medicine and allopathic medicine in the effective management of blood sugars. And generating the various usefulness of alternative medicine among diabetic patients in improving the quality of life with correct diet pattern and there by promoting tahe well-being is the theme of the study.

1.2 Statement of the problem

A Study To Assess The Effectiveness Of Holy Basil Leaves Extract In Reducing Blood Sugar Among Diabetes Mellitus Clients In Selected Urban Area At Chennai**.**

1.3 Objectives of the study

- ❖ To assess the pre test blood sugar level among Type II diabetic clients in experimental and control group.
- ❖ To assess the post test blood sugar level among Type II diabetic clients in experimental and control group.
- ❖ To assess the effectiveness of Holy Basil Leaves Extract among Type II diabetic clients in experimental group.
- ❖ To associate the findings with the selected demographic variables among Type II diabetic clients in experimental and control group.

1.4 Operational Definitions

Effectiveness

This study refers to the outcome of Holy basil in reducing blood sugar level among Type II diabetes mellitus clients.

Holy basil leaves extract

Take 15 gms of fresh holy basil leaves and soaked in 50 ml of hot water , leave it for 10mts than filter the extract.

Blood sugar level

It is the amount of glucose in the blood. In this study the standard kept for blood sugar level ranging from 130 mg/dl - 180 mg/dl.

Type II diabetes mellitus

As per the study, it refers to the clients who are diagnosed to have non-insulin dependent diabetes mellitus by a diabetologist on regular oral Hypoglycaemic Agents.

1.5 Assumption

- Holy Basil leaves extract reduces blood sugar level of Type II diabetes mellitus clients.

1.6 Hypotheses

H_1. There is a significant difference between pre test and post test blood sugar level in experimental whoare all took holy basil leaves extract.

H_2. There is a significant association between the reduced blood sugar level and selected demographic variables and clinical variables among type II Diabetes Mellitus client.

.1.7 Delimitation

- The data collection is delimited to a period of four weeks
- Clients who consume any other herbal products before the interventions
- The study participants were delimited to type II diabetic clients on regular and hypoglycaemic agents

CHAPTER – II

REVIEW OF LITERATURE

A review of related research and theory on a topic has become a standard and virtually essential activity of scientific research projects. The primary purpose of reviewing relevant literature is to give broad background knowledge and understanding of the information that is available related to the researcher's problem of interest (Polit& Hungler, 1999).

According to Polit and Hungler (1999) researcher almost never conduct a study in an intellectual vacuum; their studies are undertaken within the context of an existing base of knowledge. Researchers generally undertake a literature review to familiarize them about the topic under study.

The review consists of two parts

2.1 - Review of literature

2.2 - Conceptual Framework

2.1: Review of Related Studies

2.1.1 Review related to Prevalence of Type II Diabetes Mellitus

2.1.2 Review related to holy basil leaves in controlling diabetes mellitus

Review Related To Prevalence Of Type Ii Diabetes Mellitus

Seema Abhijeet Kaveeshwar and Jon Cornwall 2014 conducted a population based study on current status of India and report, the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India. It is predicted that by 2030 diabetes mellitus may afflict up to 79.4 million individuals in India, will also see significant increases in those affected by the disease. India currently faces an uncertain future in relation to the potential burden that diabetes may impose upon the country. Many influences affect the prevalence of disease throughout

a country, and identification of those factors is necessary to facilitate change when facing health challenges.

Sanjay Kumar Gupta, et al . (2010) conducted a population based study on diabetes prevalence in India and report .The International Diabetes Federation (IDF) estimated that there are 100 million people with diabetes worldwide that is about 6% of all adults. This figure is expected to reach around 240 million by 2010. In Asia, prevalence of diabetes is high and it has been estimated that 20% of the current global diabetic population resides in South- East Asia. Indeed, the number of cases in India is likely to double in two decades that is from 39.9 million (in 2007) to 69.9 million by 2025, The study done by Indian Council of Medical Research (ICMR) in the year 1970 reported a prevalence of 2.3% in urban areas, which had increased to 12-19% in the year 2000.

J.E. Shaw , et al . (2009) a population based survey on Global estimates of the prevalence of diabetes for 2010 and 2030 Studies from 91 countries were used to calculate age- and sex-specific diabetes prevalence's, which were applied to national population estimates, to determine national diabetes prevalence's for all 216 countries for 2010 and 2030. The world prevalence of diabetes among adults (aged 20–79 years) will be 6.4%, affecting 285 million adults, in 2010, and will increase to 7.7% and 439 million adults by 2030. Between 2010 and 2030, there will be a 69% increase in numbers of adults with diabetes in developing countries and a 20% increase in developed countries. Conclusion: These predictions, based on a larger number of studies than previous estimates, indicate a growing burden of diabetes, particularly in developing countries.

V. Mohan, et al .(2007) Madras Diabetes Research Foundation & Dr Mohan's Diabetes Specialties Centre, Chennai a Interventional study reports that India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". According to the Diabetes Atlas 2006 published by the International Diabetes

Federation, the number of people with diabetes in India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. The so called "Asian Indian Phenotype" refers to certain unique clinical and biochemical abnormalities in Indians which include increased insulin resistance, greater abdominal adiposity *i.e.*, higher waist circumference despite lower body mass index, lower adiponectin and higher high sensitive C-reactive protein levels.

V. Mohan. M, et al . (2006) published a article on current epidemic of diabetes Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban South India—the Chennai Urban Rural Epidemiology Study (CURES-17) The aim of this study was to determine the secular trends in prevalence of diabetes and IGT in urban India. The Chennai Urban Rural Epidemiology Study (CURES) screened 26,001 individuals aged ≥20 years using the American Diabetes Association fasting capillary glucose criteria. The response rate was 90.4% (2,350 responders from 2,600 potential subjects). The prevalence of diabetes and IGT in CURES were compared with three earlier studies: The overall crude prevalence of diabetes using WHO criteria in CURES was 15.5% (age-standardized 14.3%), while that of IGT was 10.6 %(age-standardized 10.2%). Prevalence of diabetes increased by 39.8% (8.3–11.6%) from 1989 to 1995; by 16.3% (11.6–13.5%) between 1995 and 2000.

CS Cockram, 2000, The Asia-Pacific region is at the forefront of the current epidemic of diabetes. The problem in the region results from a combination of large population size with rapidly rising prevalence rates, particularly of type 2 diabetes mellitus. The risk for diabetes appears to result from a combination of genetic predisposition and lifestyle change. The most important lifestyle changes relate to changes in dietary habits and physical activity and diabetes risk, particularly in younger individuals, is associated with the development of obesity and particularly central obesity. In children and adolescents in some parts of the region, type 2 diabetes now outnumbers type 1 diabetes by a ratio of 4:1. In view of the severity of the long-term

complications of diabetes, the health consequences of this epidemic will become increasingly devastating and threaten to overwhelm the health care systems in the most vulnerable countries. There is an urgent need for prioritization of diabetes as a key issue by governments throughout the region. Diabetes prevention programmes can be justified on economic, as well as humanitarian grounds. At the level of primary prevention, such programmes can be linked to other non-communicable disease prevention programmes which also target lifestyle-related issues.

2.1.2.Review Related to Effectiveness of Holy Basil Leaves in controlling diabetes mellitus

Mushtaq Ahmad, et al.(2012)*Department of Plant Sciences, Quaid-i-Azam University, Islamabad, Pakistan.* A study to record the ethno medicinal uses of indigenous plants to control diabetes mellitus. During the survey, 37 plant species belonging to 33 genera and 23 Angiospermic families were discovered. The most dominant antidiabetic plant bearing family was Fabaceae (5 spp.) The inhabitants of the study area used different parts of plants and method of their uses. About 29 phytotherapies were investigated from the rural inhabitants of the area. These traditional recipes include extracts, leaves, powders, flour, seeds, vegetables, fruits and herbal mixtures.***Ocimum sanctum*** **L. Oc*imum album* L.:** Leaves of these plant species are dried under shade, then ground to make powder (*Safoof*). One gm power is given with water twice a day for prophylactic and the treatment of diabetes.

Renu Kadian1and Milind Parle,(2012), IIMT College of Pharmacy, Greater Noida, published review article on *Ocimum sanctum* described as sacred and medicinal plant in ancient literature, commonly known as *Tulsi* is derived from *'Sanskrit'*, which means "the incomparable one". *Ocimum sanctum* has been shown to possess multifarious medicinal properties such analgesic activity, anti-ulcer activity, antiarthritic activity, immunomodulatory activity, antiasthmatic activity,antidiabetic activity, antihyperlipidemic activity,

anti-inflammatory activity, antioxidant activity, antistress activity in addition to possessing useful memory enhancer and neuroprotective activity. The present review article provides up-to-date information on the therapeutic potential of tulsi. We have tabulated the chemical constituents of *Ocimum sanctum*. This review article will help the scientists working in the area of traditional medicines and medicinal food in their research.

***Dr. Beverly Yates, 2012*,**Naturopathic Physician conducted a Experimental study on holy basil leaves controlling hyperglycemia. In a study done with rats, the use of an extract of Ocimum sanctum resulted in the partial correction of diabetes-induced inhibited activity concerning 3 enzymes that are part of carbohydrate metabolism 13. The extract was dosed at 200 mg/kg for 30 days. The enzymes noted were glucokinase, hexokinase and phosphofructokinase. A plasma glucose decrease was also noted during this study (and observed in other animal studies as well). Reduction of fasting blood sugar was observed with the addition of Ocimum sanctum leaf powder to the diet of diabetic rats; uronic acid and total amino acids were also reduced .

***Vinod Kumar, et al .(2010)*,** Article report on *Ocimum sanctum* is communally know as *"The Queen of herbs ''* is the most sacred herb of India. *Ocimum sanctum* although also known as holy basil has been revered in India for over 5000 years, as a healing balm of body, mind and spirit and is known to bestow an amazing number of health benefit offers. Modern scientific research offers effective evidences that tulsi reduces stress, enhance stamina relives inflammation, lowers cholesterol, eliminates toxin, protects against radiation, gastric ulcer, improve digestion & provide a rich supply of antioxidants & other nutrients. *Ocimum sanctum* has reported effective in supporting the heart, blood vessels, liver & lungs and also regulates blood pressure and blood sugar. The plant is reported to contain eugenol as a major chemical constituent which is a phenolic compound. *Ocimum sanctum* contain a number of beneficial compounds known as phytochemicals working together these compounds posses strong antioxidants, antibacterial, antioxidant, antiviral, adaptogenic and

immune enhancing properties that promote general health and support the body's natural defence against stress & disease.

Shankar Mondal, et al. (2009) Departments of Physiology and Microbiology,All India Institute of Medical Sciences, conducted a Experimental study on albino rabbits and reported that Medicinal properties of *Tulsi* (*Ocimum sanctum* Linn) are known for thousand years to various civilizations of the world. Scientific evidences are available on various medicinal aspects i.e. antimicrobial, adaptogenic, antidiabetic, hepato-protective, anti-inflammatory, anti-carcinogenic, radioprotective, immunomodulatory, neuro-protective, cardio-protective, mosquito repellent *etc*.The anti-diabetic properties of *Ocimum sanctum* have been evaluated in experimental animal models and very few studies on human are available.Administration of fresh *Tulsi* leaves (1 and 2 g/day) for four weeks exerted significant hypoglycaemic and uricosuric effects on fasting glucose and 24-hour urine samples in experimental adult albino rabbits .

Reddy SS, et al .(2008) conducted a Experimental study and reported that Prevention of insulin resistance by ingesting aqueous extract of *Ocimum sanctum* to fructosefed rats. *Horm Metab Res* 2008; 40: 44–49It was also found that feeding of 200 mg/kg, body weight aqueous extract of whole *Tulsi* plant for 60 days significantly delayed insulin resistance in fructose fed experimental mice

Gupta S, et al . (2006) conducted a experimental study on antidiabetic, antihypocholestrolaemic and antioxidant effect of *Ocimum sanctum* (Linn) seed oil. The seed oil of *Tulsi* when given 800 mg/kg, bw/day to experimentally induced hyperglycaemic and hypercholesterolaemic rabbits for four weeks, cholesterol levels reduced significantly with no significant effects on blood sugar level , Five hundred mg/kg, body weight *Ocimum sanctum* extract found to reduce blood sugar and oxidative stress in rats with streptozotocin-induced diabetes.

Hannan JMA, et al . (2006) published a report on *Ocimum sanctum* leaf extracts stimulate insulin secretion from perfused pancreas, isolated islets and clonal pancreatic beta-cells. The alcoholic extract and other organic solvent fraction's extract has been found to stimulate insulin secretion from perfused rat pancreas, isolated islets and clonal pancreatic β-cells. The proposed mechanism of action for the secretion of insulin is that, *Tulsi* extract is able to stimulate adenylate cyclase/ cAMP or the phosphatidylinositol or direct effect on exocytosis that induce mobilization of intracellular Ca++ as well as promoting Ca++ entry .

Anand Kar School of Life Sciences, Devi Ahilya University, Indore, India. Pharmazie . (2004) , a cohart study to unravel the possible mechanism of glucose lowering activity, effects of ten different plant extracts in the regulation of serum cortisol and glucose concentrations were evaluated in male mice. It appears that the hypoglycaemic effects of former three plant extracts are mediated through their cortisol inhibiting potency, whereas the mechanism for other plant extracts could be different. Lipid-peroxidation was not enhanced by any of the plant extracts (some were in fact, antiperoxidative in nature). As I. racemosa, B. diffusa and O. sanctum exhibited antiperoxidative, hypoglycaemic and cortisol lowering activities, it is suggested that these three plant extracts may potentially regulate corticosteroid induced diabetes mellitus.

Vats V, Yadav SP, Grover JK. (**2004) ,** a comparative study on Ethanolic extract of *Ocimum sanctum* leaves partially attenuates streptozotocin-induced alteration in glycogen content and carbohydrate metabolism in rats. Similarly, methanolic extract of *Tulsi* when given to experimental animals at a dose of 200 mg/kg, for 30 days, the activities of glucokinase and hexokinase was increased significantly .

Rai V, et al . (1997), a Experimental study and reported thatEffect of Tulasi (*Ocimum sanctum*) leaf powder supplementation on blood sugar levels, serum lipids and tissue lipids in diabetic rats. *Tulsi* also showed hypoglycaemic activity along with other herbal formulations. Dry *Tulsi* leaf powder when fed at 1% of total diet for 30 days tothe rats with diabetes induced by alloxan, fasting blood sugar, uronic acid, total amino acids, total cholesterol, triglyceride, phospholipids and total lipids reduced significantly .

Rai V,et al . (1997), a comparative study Effect of *Ocimum sanctum* leaf powder on blood lipoproteins, glycated proteins and total amino acids in patients with non-insulin dependent diabetes-mellitus. In another trial on 27 NIDDM patients, it was observed that supplementation of *Tulsi* powder along with hypoglycaemic drugs for one month could significantly decrease the blood sugar, glycosylated proteins, total amino acids, uronic acid, triglycerides, low density lipoprotein (LDL) and very low density lipoprotein (VLDL), compared to control group on similar hypoglycaemic drugs. However, there was no significant change in high density lipoprotein (HDL) level

***Agrawal P, et al . (1996)*,** Randomized placebo-controlled, single blind trial of holy basil leaves in patients with noninsulin-dependent diabetes mellitus. Experimental studies on albino rats reported that leaf extract of ocimum sanctum and Ocimum album (holy basil) had hypoglycemic effect. Results indicated a significant decrease in fasting and postprandial blood sugar levels during treatment with holy basil leaves compared to during treatment with placebo leaves. Fasting blood sugar fell by 21.0 mg/dl, confidence interval of difference -31.4 - (-)11.2 ($p < 0.001$), and postprandial blood sugar fell by 15.8 mg/dl, confidence interval -27.0 - (-)5.6 ($p < 0.02$). The lower values of glucose represented reductions of 17.6% and 7.3% in the levels of fasting and postprandial blood sugar, respectively. Urine glucose levels showed similar trend.

2.2 Conceptual Frame Work

Conceptual framework is a group of concepts and set of proportion that spells out the relationship between them. Conceptual framework, conceptual model, and conceptual scheme deals with abstractions that are assembled by virtue of their relevance to a common theme; conceptual framework plays several inter related roles in the progress of science. It serves as a spring board for the generation of research hypothesis can provides an important concept for scientific research. The present study aims at evaluating the effectiveness of holy basil leaves extract in reducing blood sugar level among elderly people at selected urban area of chennai.

In this study, Imogene Modified king's goal attainment theory was used. The theory based on the assumption that humans and who are having constant interaction, perception, communication, transaction, role, stress and growth and development, time and space. The definition of these concepts is as follows:

Interaction

According to Imogene Making, each individual brings to an interaction with different set of values, ideas, attitude and perception to exchange. In this study, both the investigator and the clients type II Diabetes Mellitus comes together and the investigator do pre assessment of blood sugar level and explain the procedure of consuming holy basil leaves extract and get their consent for research.

Perception

According to Imogene M.King, it is the primary features of the personal system because it influence all the other behaviours, refers to a person's representation of reality. In this study, the clients with Type II Diabetes

Mellitus are consistent with different demographic variables (age, education, occupation, diet, exercise income, duration of treatment, treatment modality, and symptoms of DM) which influence their behaviours related to consuming holy basil leaves extract in reducing blood sugar level.

Communication

It is defined as "a process whereby information is given from one person to another either directly in face-to-face meetings or indirectly through telephone, television, or the written word.", in this study the community health nurse presents explanation and demonstration about preparing and consuming holy basil leaves extract mix to the study participants.

Transaction

It is a process of interactions in which human beings communicate with the environment to achieve goals that are valued; transactions are goal-directed human behaviors, the outcome of the study shows that there is a significant reduction of Fasting blood sugar level in post assessment.

Role

According to Imogene M. King's each person occupies in a social system have specific roles and obligations. In this study, the investigator occupies health educator role and clients with Type II Diabetes Mellitus occupies study participant's role.

Person

Person is rational purposeful, active and time oriented being, they have fundamental health needs such as timely and useful health information, care that prevents illness and helps when the self-care demands cannot be met. In this study the person is the client with Type II Diabetes Mellitus.

Environment

Environment in the open system allows the exchange of matter, energy and the information. In this study the environment is the home of the client with Type II Diabetes Mellitus

Health

Health is described as the dynamic state in the life using personal resources to achieve optimal daily living. All the clients in this study have deviated from health and need assistance to get back to optimal level of health.

Nursing

Nursing is an art and science. The function of the nursing is to promotes, maintains, restore health, and prevent infection and complication, and cares for the sick. In this investigator uses a goal oriented approach in which the client and the investigator interact to attain goal so that can perform their own role independently. Here the researcher the nurse who gives holy basil leaves extract to the experimental group clients with Type II Diabetes Mellitus.

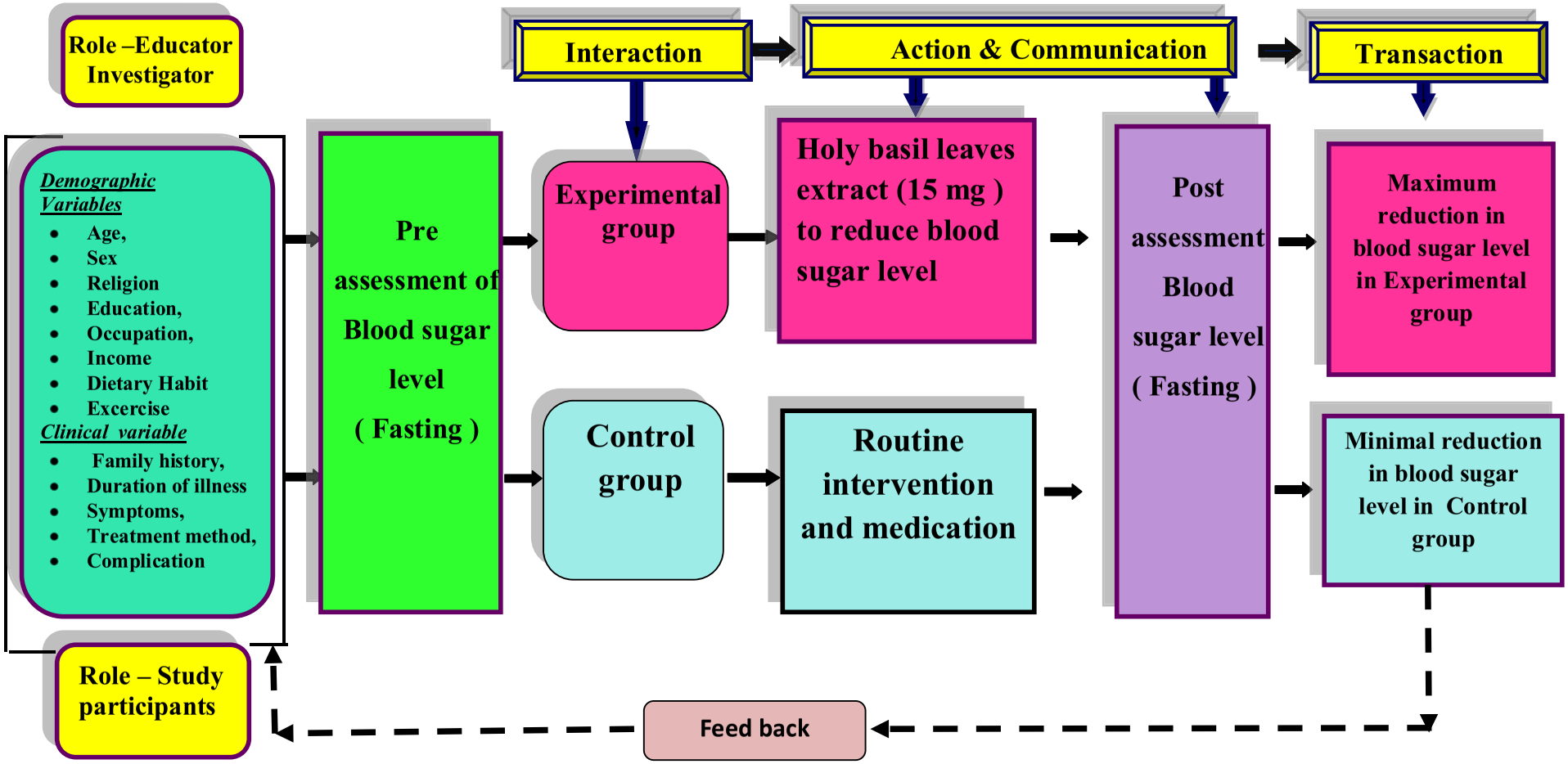


Figure 1: Conceptual Frame work based on Modified King's Goal Attainment Theory

CHAPTER-III

METHODOLOGY

This chapter deals with the research design, the variable of the study the setting, the population, sample, sample size, sample technique, selection criteria development and description, content validity, pilot study, reliability, data collection procedure and for data analysis.

3.1. Research approach

The research approach adopted for this study is a quantitative approach. This study aims to assess the effectiveness of Holy Basil Leaves Extract in reducing blood sugar among diabetes mellitus clients in selected urban area at Choolai .

3.2. Data collection period

The duration of data collection was Four weeks from 16/07/2015 to 15/08/2015.

3.3 Study Setting

This study was conducted in urban area (Choolai) which belongs to the north zone of Chennai corporation and it is just 3 kilometers away from the college of Nursing, Madras Medical College, Chennai.

The center covering the total population of 58,744 .Totally there are 16 streets in choolai area. In that 16 streets from four streets the list of diabetes clients [96 No_s] were collected from survey to conduct the study. The setting was selected based on the feasibility of conducting the study, avililability of the sample, convenience to the investigator.

3.4 Study Design

The research design helps to select the subjects, identify the variables, their manipulation and control, observation to be made and the type of

statistical analysis to interpret the data. The selection of the design was based on the purpose of the study.

The research design selected for the present study is **Experimental design.**

(Pre-test, Post- test design)

Experimental group : Q_1 ⟶ X ⟶ Q_2

Control group : Q_3 ⟶ ● ⟶ Q_4

Q_1: Pre assessment of the blood sugar level in experimental group.

Q_2: Post assessment of the blood sugar level in experimental group.

X: Administration of Holy basil leaves extract among clients in Experimental group.

Q_3: Pre assessment of the blood sugar level in control group.

Q_4: Post assessment of the blood sugar level in control group.

● **:** Routine care for control group

Table 3.1 : Blood glucose level assessment

Group	**Pretest O1**	**Treatment x**	**Posttest O2**
Experimental Group	Blood glucose level assessed (Fasting)	50 ml of Holy Basil leaves extract with existing treatment.	Blood glucose level assessed (Fasting)
Control Group	Blood glucose level assessed (Fasting)	Existing Treatment	Blood glucose level assessed (Fasting)

3.5 Study Population

Population is the entire aggregation of subjects that meet designed criteria. The target population of the study is the clients (Male and Female) with Type II Diabetes Mellitus between 40-60 years of age who are all on oral hypo

glycaemic agent at Choolai. The total clients with Type II Diabetes mellitus from the selected streets in Choolai were 96.

3.6. Sample size

Sample refers to subjects of a population selected to participate in a research study. In this present study the selected samples were clients with Type II Diabetes Mellitus who met inclusion criteria. In this present study the sample size comprises of 60 clients with Type II Diabetes Mellitus. (30 Control group, 30 Experimental group)

3.7. Criteria for selection of the sample

3.7.1 Inclusion Criteria:

- Type II diabetes mellitus clients on Oral Hypoglycemic Agents with the age group of 40 – 60yrs.
- clients who are all having fasting blood sugar above 130mg/dl
- Patients who are able to speak and understand, Tamil or English.
- Type 2 diabetes mellitus clients on Oral Hypoglycemic Agents patients who are all willing to participate in this study.

3.7.2 Exclusion criteria:

- Clients who are on insulin therapy.
- Clients who are associated with other co – morbid illness
- Clients whose fasting blood sugar is above 180 mg/dl.

3.8. Sampling technique

Simple random sampling technique was used for this study. The researcher collected the list of TypeII Diabetic clients of Choolai from survey . The list of clients with known diabetic and on regular treatment with Oral hypoglycaemic drugs with out any other diseases were collected with the total of 96 clients, using the Lottery method, 60 samples were selected from the sampling frame based on the inclusion and exclusion criteria.

3.9 Research Variables

Independent variable – Holy basil leaves extract.

Dependent variable _ Level of blood sugar among Type II Diabetes Mellitus Client.

3.10. Development and description of the tool

Data collection tools are the procedures or instruments used by the researcher to observe the key variables in the research problem

3.10.1Development Of Tool

The tool for data collection was formulated by the investigator by consulting the experts in Nursing statistics and Community medicine department. The tool has two section with demographic variables and clinical related informations. The blood sugar was analysed by using glucometer.

3.10.2 Description of the. tool:

The tool consists of two sections. The tool used in this study was on interview and observation schedule in blood glucose for the Type II diabetes Mellitus client on 40 – 60 years of age.

Section A – This section deals with demographical data collected by structured interview questionnaire which includes age, sex, education qualification, monthly family income, occupation, religion, diet pattern, frequency of Non-vegetarian, Exercise habit, types of exercise, and knowledge regarding benefits of Tulasi.

Section B - Clinical related informations which includes duration of illness, family history of illness, medications used by the client, symptoms felt by the client, complication of diabetes.

Observation schedule includes pre- test assessment of Fasting blood glucose level of both experimental and control group and there after post interventional assessment of blood glucose on 15th day for both the group.

Blood glucose level assessment

The investigator is to assess and record blood glucose level before and after administration of Holy Basil Leaves Extract**.**

TABLE 3.1Assessment of blood glucose level

Group	**Pretest O1**	**Treatment x**	**Posttest O2**
Experimental Group	Blood glucose level assessed (Fasting)	50 ml of Holy Basil leaves extract with existing treatment.	Blood glucose level assessed (Fasting)
Control Group	Blood glucose level assessed (Fasting)	Existing Treatment	Blood glucose level assessed (Fasting)

1. Maximum reduction of blood glucose level : 30mg /dl
2. Minimum reduction of blood glucose level : <10 mg /dl

3.10.3 Content Validity

Content validity of the tool was assessed by obtaining an opinion from experts in the field of community medicine, statistical and community health nursing. The experts were an associate professor and reader respectively. There was an uniform agreement to the tool adopted for conducting the study. Hence, the investigator proceeds with the same tool.

3.11 Ethical Considerations

The study objectives, Intervention and data collection procedure were approved by the Research and ethics committee, of Madras Medical College Chennai. All respondents were carefully informed about the purpose of the study and their part during the study. Informed consent for the study was obtained from all participants. Confidentiality of the subject's information was maintained. Thus the investigator followed the ethical guidelines, which were issued by the research committee. Necessary permission to conduct the study was requested and obtained from the city health officer of Chennai Corporation, and Departmental head of community health nursing, College of nursing, Madras Medical College. The study was done without any violation of human rights.

3.12 Pilot Study

The pilot study was conducted at Choolai, Chennai by obtaining prior permissionfrom the authorities and conducted with six clients, who fulfilled the inclusion criteria. The study in which the prior conducted was excluded for the main study. The data related to the variables were collected. The pre and post assessment of blood sugar level was given to the experimental group by investigator in person. Results were analysed. The investigator found that the instrument was feasible to use and further no modifications were needed before the actual implementation of the study.

3.13. Reliability of the tool

After the pilot study reliability of the tool was established by an inter rater reliability method. The obtained reliability co-efficient was high (r = 0.87)

3.14 Data Collection Procedure

Formal written permission was obtained from the City Health officer Chennai and the zonal officer. The data collection was done for four weeks in choolai urban area of Chennai. From Monday to Saturday, the data was collected.

The objective of the study was explained to the medical officer and other paramedical personnel, who were posted in the Choolai Health post. Before starting the data collection to get their cooperation during the data collection. Based on the criteria for sample selection 10 subjects from the experimental group and control group were selected each day.

The subjects were explained about the purpose of the study and were assured of confidentiality of the data collected. Adequate privacy was provided. On the first day of sample selection, the demographic data and pre assessment of blood sugar level of the subjects were assessed. The participants was instructed in Fasting state and blood was drawn for sugar and estimated by Glucometer.

They were selected to either control group or experimental group. Then they were administered 50 ml / day of Holy Basil leaves extract (15 gms holy basil leaves + 50 ml of hot water) for 14 days had taken after the breakfast .The Diabetes Mellitus clients continue their Oral Hypoglycemic Agents. Fasting blood sugar was estimated at the end of 15 th day for both groups. The result will be analyzed by appropriate statistical tests for both experimental and control group.

3.14 Intervention protocol :

Table 3.1 : Intervention protocol for Diabetic clients

s.no	Protocal	Experiment group	Control group
1	Place	Client home	Client home
2	Intervention tool	Holy basil leaves extract with existing treatment Structured questionar	Routine Treatment Structured questioner
3	Duration of Intervention	Fourteen days	Fourteen days
4	Frequency	Morning/ daily	Morning / daily
5	Time	8 -9am	9 - 10am
6	Administrator	Investigator	_____

Preparation of Holy Basil Leaves Extract :

Take 15 gms of Fresh Holy Basil leaves Soaked in 50 ml of hot water and Leave it for 10 mts than Filter the extract . The extract was given at daily after breakfast.

3.15.Data Entry And Analysis:

Data entry : Enter the data into the excel sheet and coding the data.

Analysis : Collected data will be analyzed by descriptive and inferential statistics.

1 Descriptive analysis:

- Frequency and percentage analysis was used to describe demographic characteristics of type II Diabetic clients...

- Range, mean and standard deviation was used to assess the reduction of blood sugar in type II Diabetic clients.

2 Inferential analysis:

- Paired t-test was used to test to compare the pre-test and post-test knowledge.
- Chi-square analysis was used to find out the association between the pre-test knowledge scores and demographic variables.
- P value 0.05 and <0.05 was considered statistically significant.

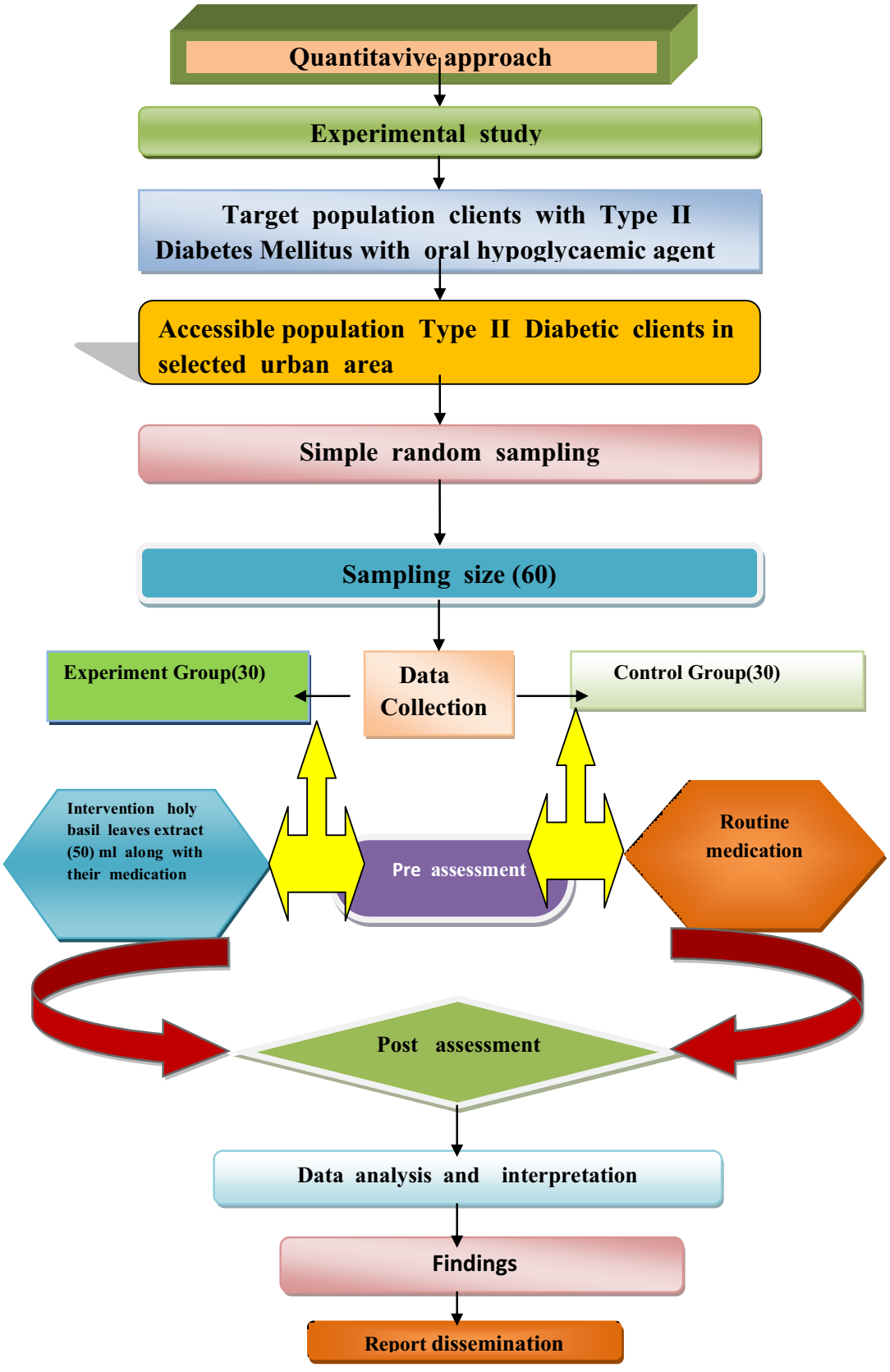


Figure: 3.2 : Schematic Representation of Research Design

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of data collected from 60 samples of Type II Diabetic patients to evaluate the effectiveness of holy basil leaves on blood sugar level among Type II Diabetic patients residing at urban areas of Chennai.

Organization Of Data

The findings of the study were grouped and analyzed under the following sections.

Section-A : Frequency and percentage distribution of demographic variables and clinical related variables of Type II Diabetic clients with oral hypoglycaemic agent in experimental and control group.

Section-B : Assessment of blood sugar level among Type II Diabetic patients before and after providing holy basil leaves in experimental group.

Section-C : Compare the Pretest and post test blood sugar level among Type II Diabetic patients after providing holy basil leaves in experimental and control group.

Section-D : Effectiveness of Holy Basil Leaves among Type II Diabetes clients.

Section -E : Association of post test blood sugar level among Type II Diabetic patients in experimental and control group

Section-A :

Table 4.1 :Distribution of Demographic Variables of client with Type II Diabetic mellitus

S.NO	DEMOGRAPHIC VARIABLES		CONTROL		EXPERIMENTAL		CHI SQUARE
			frequency	In %	frequency	In %	
1	Age	40-45	6	20	6	20	$\chi^2 = 0.1$ P=0.990
		46-50	9	30	10	33.3	
		51-55	6	20	6	20	
		56-60	9	30	8	26.7	
2	Sex	Male	13	43.3	13	43.3	$\chi^2 = 0.04$ P=1
		Female	17	56.7	17	56.7	
3	Religion	Hindu	27	90.0	26	88.3	$\chi^2 = 0.352$ P=0.839
		Muslim	2	6.7	2	6.7	
		Christian	1	3.3	2	6.7	
4	Education	No Formal Education	2	6.7	1	3.3	$\chi^2 = 2.33$ P=0.801
		Primary	9	30	9	30	
		Secondary	15	50	15	50	
		Higher Sec	2	6.7	2	6.7	
		Graduate	1	3.3	0	0	
		Diploma	1	3.3	3	10	
5	Occupation	Home Maker	11	36.7	12	40	$\chi^2 = 0.96$ P=0.992
		Private Employee	6	20	6	20	
		Govt. Employ	3	10	3	10	
		Self Employee	10	33.3	9	30	
6	Monthly family Income (in Rupees)	<1589	2	6.7	3	10	$\chi^2 = 0.545$ P=0.969
		1590 – 4726	4	13.3	3	10.10	
		4727 – 7877	9	30	8	26.7	
		7878 – 11816	12	40	12	40	
		11816 <	3	10	4	13.3	
7	Dietary Habits	Vegetarian	4	13.3	3	10	$\chi^2 = 0.162$ P=0.688
		Nonvegetarian	26	86.7	27	90	
8	Frequency Of Non-Veg	Weekly Once	8	26.7	8	26.7	$\chi^2 = 0.286$ P=0.991
		Weekly Twice	14	46.7	14	46.7	
		Monthly Once	3	10	4	13.3	
		Monthly Twice	1	3.3	1	3.3	
#9	Exercise	Yes	8	26.7	10	33.3	$\chi^2 = 0.317$ P=0.573
		No	22	73.3	20	66.7	
10	Type Of Exercise	Walking	7	23.3	9	30	$\chi^2 = 0.345$ P=0.841
		Cycling	1	3.3	1	3.3	
		Yoga	0	0	0	0	
		Others	0	0	0	0	
11	Knowledge regarding benefits of tulasi	Respiratory Problem	18	60	17	56.7	$\chi^2 = 0.105$ P=0.991
		Gastric Problem	3	10	3	10	
		Improve Immunity	3	10	3	10	
		Religious	6	20	7	23.3	

* Significant ---------- p = $\leq$ 0.05

** - highly significant------ p = $\leq$ 0.001

*** - very high significant p = $\leq$ 0.0001

- The above table 1 reveals that most of the Type II Diabetic Patients 30%(9) were in the age group of 56-60 and 46-50 years , and 20% (6) were in both 40-45 years and 51-55 years in control group and 33.3%(10) were in 46-50 years, -60 years, and 20.0% (10)were in 40-45,51-55 years
- In the experimental group and majority of them were females 56.7%(17) in both control and experimental group on the basis of religion most of them are Hindus 88.3%(26)in experimental and 90%(27) in control group.
- On the basis of occupation majority of them were homemakers 40 %(12) in experimental and 36.7 %(11) in control group. Majority of the Type II Diabetic Patients 50.0%(15) in experimental and control group were educated up to secondary school level, very less percentage 3.3% (1) in experimental and 6.7% (2) in control group were illiterate, around 10% (3) in experimental and 3.3% (1) in control group were diploma holders, only 3.3% (1) in control group were graduate, same percentage of participants in both group 6.7% (2) were completed their higher secondary education.
- Majority of the diabetic clients 90% (27) in control group were non vegetarian, Among Type II Diabetic clients only 26.7%(8) in control group and 33.3% (10) in experimental group were following exercise in their daily activity, and majority of them 23.3%(7) in control and 30%(9) in experimental were doing walking,
- Sixty percentage of Diabetic clients in experimental group and 56.7% of diabetic clients in control group are aware of benefits of Tulasi in controlling respiratory problem.

Table 4.2. Clinical variables of clients with Type II Diabetes Mellitus

Particulars	Medical related information	Control		Experimental		Chi square
		N	%	N	%	
Family history	Yes	17	56.7	15	50	X^2 =0.268
	No	13	43.3	15	50	p=0.605
If yes means	Father	7	23.3	5	16.7	X^2 =0.924
	Mother	6	20	6	20	p=0.924
	Sibbling	4	13.3	4	13.3	
Duration of illness	< 1 year	2	6.7	2	6.7	X^2 =0.000
	1 – 3 year	5	16.7	5	16.7	p=1
	3 – 5 years	5	16.7	5	16.7	
	>5 years	18	60	18	60	
Symptoms before treatment	Giddiness	12	40	12	40	X^2 =0.202
	Excessive thirst hunger & urination	7	23.3	7	23.3	p=0.995
	Itching in genital area	6	20	5	16.7	
	All the above	1	3.3	1	3.3	
	Not known	4	13.3	5	16.7	
Duration of treatment	**< 1 year**	**2**	**6.7**	**2**	**6.7**	X^2 =0.000
	1-3 years	5	16.7	5	16.7	p=1
	3-5 years	6	20	6	20	
	>5 years	17	56.7	17	56.7	
Are you on regular treatmetnt	Yes	25	83.3	25	83.3	X^2 =0.000
	No	5	16.7	5	16.7	p=1.00
Type of medication	Allopathy	30	100	30	100	X^2 =0.000
If allopathy specify	Met formin	26	86.7	30	100	X^2 =4.286
	Daonil	2	6.7			p=0.232
	Gllipizide	1	3.3			
	Glimipride	1	3.3			
Experienced symptom	Giddiness	11	36.7	12	40	X^2 =0.511
	Palpitation	2	6.7	1	3.3	p=0.916
	Profuse sweating	6	20	5	16.7	
	Others	11	36.7	12	40	
Knowledge regarding Complications of Diabetes mellitus	Eye problem	6	20	7	23.3	X^2 =2.732
	Kidney problem	4	13.3	4	13.3	p=0.842
	Nerve problem	4	13.3	1	3.3	
	Cardiac problem	3	10	3	10	
	Foot ulcer	7	23.3	6	20	
	CVA	4	13.3	5	16.7	
	Others	2	6.7	4	13.3	

* Significant ---------- p = $\leq$ 0.05

** - highly significant------ p = $\leq$ 0.001

*** - very high significant p = $\leq$ 0.0001

The table 4.2 shows the medical related information about the study participants among the participants most of them 50%(15) in experimental, 56.7%(17) in control group were having family history of diabetes mellitus, and in that 23.3%(7) in control group and 50%(15) in experimental group members father had diabetes mellitus, and same percentage 20%(6) of participants' mother had diabetes mellitus, 60%(18) of experimental and control group participants were having diabetes more than 5 years, about 23.7%(7) of participants in both group have excessive thirst, hunger and urination.

Among the type II diabetes clients around 56.7 %(17) of participants in both group are on medication above 5 years, and around 83.3 %(25) were on regular treatment. All the type II diabetic clients are taking allopathic medication among that 100 %(30) in experimental and 86.7 %(26) in control were taking Tab. Metformin, Majority of the participants experienced giddiness 40 %(12) in experimental and 36.7 %(11) in control group. Most of the participants believed complication of DM is eye problem 23.3 %(7) in experimental and 20 %(6) in control group.

Section B: Pre and post assessment of blood sugar level among experimental and control group

Table4. 3. Pre and Post assessment score of blood sugar level among experimental and control group

Type of blood sugar	Group	N	Mean	SD	Paired t test
Pre test	Experiment	30	172.27	9.720	t= 4.68 ** p =0.001
	Control	30	159.27	11.715	
Post test	Experiment	30	140.23	14.330	t =- 5.01 ** p = 0.001
	Control	30	157.33	11.828	

* Significant ---------- p = ≤ 0.05

** - highly significant------ p = ≤ 0.001

*** - very high significant p = ≤ 0.0001

The above table reveals the comparison of pre test and post test Blood sugar level among Experiment and Control group. It shows that the comparison was made by student independent test and the t value of pre test among Experiment and Control group is 4.68 , df =58, p=0.001 is statistically significant. Likewise the t value of post test among Experiment and Control group is - 5.01, df = 58, p= 0.001 it is also statistically significant.

Section C : Comparison Of Pre And Post Test In Both Group

Table 4.4. Comparison of pre test and post test blood sugar level among Experiment and Control group.

Group	Level of Assessment	Mean Blood sugar level	Mean difference in effectiveness with 95% CI	Percentage of effectiveness with 95% CI
Experiment	Pre test	172.27	32.04 (27.86 – 36.22)	18.6% (16.17 – 21.02)
	Post test	140.23		
Control	Pre test	159.27	1.94 (1.3 – 2.58)	1.22% (0.82 – 1.62)
	Post test	157.33		

The above table 4 shows the effectiveness of holy basil leaves extract on reducing blood sugar level among experimental and control group. In experimental group the mean difference score is 32.04 with 95% confidence interval, and in control group the mean difference value is only 1.94% with 95%confidence interval.. This results shows the effectiveness of holy basil leaves helps in reducing blood sugar level. Finally average effectiveness of holy basil leaves in experimental was 18.6%,and the distribution found within 16.17% - 21.02%. But in control group average reduction was 1.22% , and the distribution found within 0.82% - 1.62%.

Section D:Effectiveness of Holy Basil Leaves on Blood Sugar among Type II Diabetic clients

Table 4. 5: Effectiveness of Holy basil leaves extract on reducing blood sugar Level among experimental and control group

Blood test	Group	Reduced % of Blood sugar level	Benefit of study
Fasting	Experimental	**18.6%**	**17.38%**
	Control	**1.22%**	

The above table shows the effectiveness of the study. It reveals that there is 18.6% of reduction found in experimental group but in control group there is only 1.22%. Around 17.38% of reduction of blood sugar level in experimental group when compared with the control group. Thus the hypothesis was proved.

Section E:

Table 4.6 Association between level of blood sugar reduction and their demographic variables (Experimental Group)

Demographic variables		Blood sugar levels								Total		Chi square
		Decrease <10mgs		Decrease 11-19mgs		Decrease 20-29mgs		Decrease >30mg& above				
		N	In%	N	In %	N	In%	N	In%	N	In%	
Age	40-45	0	-	1	3.3	1	3.3	4	13.3	6	20	$X^{2=}$3.385 P=0.947
	46-50	1	3.3	1	3.3	2	6.7	6	20	10	33.3	
	51-55	0	-	0	-	2	6.7	4	13.3	6	20	
	56-60	0	-	1	3.3	2	6.7	5	16.7	8	26.7	
Sex	Male	0	-	2	6.7	4	13.3	7	23.3	13	43.3	$X^{2=2.300}$ P=0.513
	Female	1	3.3	1	3.3	3	10	12	40	17	56.7	
Religion	Hindu	1	3.3	3	10	6	20	16	53.3	26	86.7	$X^{2=2.186}$ P=0.902
	Muslim	0	-	0	-	0	-	2	6.7	2	6.7	
	Christian	0	-	0	-	1	3.3	1	3.3	2	6.7	
Education	No formal education	0	-	0	-	0	-	1	3.3	1	3.3	$X^{2=14.144}$ p=0.292
	Primary	0	-	1	3.3	3	10	5	16.7	9	30	
	Secondary	0	-	1	3.3	4	13.3	10	33.3	15	50	
	Higher sec	0	-	0	-	0	-	12	6.7	2	6.7	
	Graduate	0	-	0	-	0	-	12	6.7	2	6.7	
	Diploma	1	3.3	1	3.3	0	-	1	3.3	3	10	
Occupation	Home maker	0	-	0	-	2	6.7	10	33.3	12	40	$X^{2=15.121}$ P=0.088
	Private employee	0	-	1	3.3	2	6.7	3	10	6	20	
	Govt. Employ	1	3.3	1	3.3	0	-	1	3.3	3	10	
	Self employee	0	-	1	3.3	3	10	5	33.3	9	30	
Monthly family Income (in Rupees)	<1589	0	-	1	3.3	0	-	2	6.7	3	10	$X^{2=15.821}$ p=0.200
	1590 – 4726	0	-	0	-	2	6.7	1	3.3	3	10	
	4727 – 7877	0	-	0	-	1	3.3	7	23.3	8	26.7	
	7878 – 11816	0	-	1	3.3	3	10	8	26.7	12	40	
	11816 <	1	3.3	1	3.3	1	3.3	1	3.3	4	13.3	
Dietary Habits	Vegetarian	1	3.3	0	-	0	-	2	6.7	3	30	$X^{2=10.117}$ P=0.18
	Nonvegetarian	0	-	3	10	7	23.3	17	56.7	27	90	
Frequency Of Non-Veg	Weekly once	0	-	2	6.7	2	6.7	4	13.3	8	26.7	$X^{2=13.35}$ * p=0.044
	Once in a week	0	-	1	3.3	4	13.3	9	30	14	46.7	
	Monthly once	0	-	0	-	1	3.3	3	10	4	13.3	
	Monthly twice	0	-	0	-	0	-	1	3.3	1	3.3	
Exercise	Yes	1	3.3	1	3.3	3	10	5	16.7	10	33.3	$X^{2=2.707}$ P=0.439
	No	0	-	2	6.7	4	13.3	14	46.7	20	66.7	
Type Of Exercise	Walking	1	3.3	1	3.3	2	6.7	5	16.7	9	30	$X^{2=5.923}$ *P=0.042
	Cycling	0	-	0	-	1	3.3	0	-	1	3.3	
	Yoga	0	-	0	-	0	-	0	-	0	-	
	Others	0	-	0	-	0	-	0	-	0	-	
Knowledge Regarding Benefits Of Tulasi	Respiratory problem	0	-	3	10	5	16.7	9	30	17	56.7	$X^{2=14.544}$ p=0.104
	Gastric problem	0	-	0	-	0	-	3	10	3	10	
	Improve immunity	1	3.3	0	-	1	3.3	1	3.3	3	10	
	Religious	0	-	0	-	1	3.3	6	20	7	23.3	

* Significant --- p = ≤ 0.05

** - highly significant------ p = ≤ 0.001,

*** - very high significant p = ≤ 0.0001

The table 4.6 shows the association between the level of blood sugar reduction and their demographic variables in experimental group among this. The participants those who are non vegetarian had more reduction in their blood sugar level. Their chi-square value is x^2 =13.35 and p = 0.044. It is statistically significant. There is also a marked reduction in the group of participants those who are doing regular exercises. X^2 = 5.923, p = 0.042 it is statically significant it shows the effectiveness of the study. Other variables such as age, gender, relious status, occupation, income, and knowledge regarding tulsi were not influenced reduction of blood sugar among the type II diabetic clients.

Table 4.7 Association between level of blood sugar reduction and their clinical related variables (Experimental Group)

Variables		Level of Blood sugar								Total		Chi –square
		Decrease <10		Decrease 11-19		Decrease 20-29		Decrease 30 & above				
		N	In %	N	In %	N	In %	N	In %	N	In %	
Family history	Yes	0	-	2	6.7	2	6.7	11	36	15	50	$X^{2=}3.093$ P=0.378
	No	1	3.3	1	3.3	5	16.7	8	42.1	15	50	
Relationship	Father	0	-	2	6.7	0	-	3	10	5	16.7	X^2=10.772 P=0.292
	Mother	0	-	0	-	2	6.7	4	13.3	6	20	
	sibbling	0	-	0	-	0	-	4	13.3	4	13.3	
Duration of Illness	< 1year	0	-	0	-	0	-	2	6.7	2	6.7	X^2=13.348 P=0.147
	1-3year	0	-	0	-	4	13.3	1	3.3	5	16.7	
	3-5year	0	-	0	-	1	3.3	4	13.3	5	16.7	
	>5 year	1	3.3	3	10	2	6.7	12	40	18	60	
Symptoms before diagnosed	Giddiness	1	3.3	1	3.3	2	6.7	8	26.7	12	40	X^2=12.850 P= 0.380
	↑hunger, thrust, urination	0	-	1	3.3	2	6.7	4	13.3	7	23.3	
	Itching in genital area	0	-	0	-	2	6.7	3	10	5	16.7	
	All the above	0	-	1	3.3	0	-	0	-	1	3.3	
	Not known	0	-	0	-	1	3.3	4	13.3	5	16.7	
Duration of treatment	< 1 year	0	-	0	-	0	-	2	6.7	2	6.7	X^2 =13.787 * P= 0.030
	1-3 year	0	-	0	-	4	13.3	1	3.3	5	16.7	
	3-5 year	0	-	0	-	1	3.3	5	16.7	6	20	
	>5 year	1	3.3	3	10	2	6.7	11	36.7	17	56.7	
Regularity of treatment	yes	1	3.3	3	10	5	16.7	16	53.3	25	83.3	X^2= 1.525 P= 0.677
	No	0	-	0	-	2	6.7	3	10	5	16.7	
Drugs	Metformin	1	3.3	3	10	7	23.3	19	63.3	30	100	Constant
Experienced Hypo glycemic symptoms	Giddiness	1	3.35	1	3.3	2	6.7	8	26.7	12	40	X^2=11.922 P= 0.218
	Profuse sweating	0	-	0	-	2	6.7	3	10	5	16.7	
	palpitation	0	-	1	3.3	0	-	0	-	1	3.3	
	Others	0	-	1	3.3	3	10	8	26.7	12	40	
Knowledge of complication	Eye problem	1	3.3	1	3.3	3	10	2	6.7	7	23.3	X^2=13.839 P=0.740
	Kidney problem	0	-	0	-	0	-	4	13.3	4	13.3	
	Nerve problem	0	-	0	-	0	-	1	3.3	1	3.3	
	Cardiac problem	0	-	0	-	1	3.3	2	6.7	3	10	
	Foot ulcer	0	-	2	6.7	1	3.3	3	10	6	20	
	CVA	0	-	0	-	1	3.3	4	13.3	5	16.7	
	others	0	-	0	-	1	3.3	3	10	4	13.3	

* Significant ---------- $p = \leq 0.05$

** - highly significant------ $p = \leq 0.001$

*** - very high significant $p = \leq 0.0001$

The table 4. 7 shows the association between the level of blood sugar and their clinical variables in Experimental group among this. The participants those who are taking regular treatment are having more reduction in their blood sugar level. Their chi- square value is $x^2 = 13.787$ and $p = 0.030$. It is statistically significant. There is also a marked reduction in the group of participants those who are taking regular treatment more than 5 years. It shows the effectiveness of the study. The other variables such as family history, pre diagnosed symptoms, duration of illness,knowledge regarding complications were not infiuenced in reduction of blood sugar among typeII diabetic clients.

Table 4. 8 : Frequency and percentage distribution of post test reduction of blood sugar level among Type II Diabetic clients in both experimental and control group

S.No	Score	Group						Chi - square
		Experimental		Control				
		N	In %	N	In %	N	In %	
1	Decrease 30 mgs & above	19	63.3	0	0	19	31.7	X^2 =44.141 P = 0.001
2	Decrease 20 -29 mgs	7	23.3	2	6.7	9	15	
3	Decrease 11 - 19 mgs	3	10	3	1	6	10	
4	Decrease < 10 mgs	1	3.3	10	33.3	11	18.3	
5	No crease	0	0	15	50	15	25	

*** Significant- p = ≤ 0.05 ,**
**** - highly significant- p = ≤ 0.001**
,* - very high significant p = ≤ 0.0001**

The above table shows the distribution of post test reduction of Blood sugar level among Type II Diabetic client in both experimental and control group. Majority of the Type II Diabetic client in experimental group 63.3% (19) of participants had 30mg and above reduction in blood sugar level, but in control group there is no reduction in blood sugar level of 30mg and above.In experimental group 23.3% (7) of participants had 20-29 mgs reduction in blood sugar level, but in control group 6.7 % (2) of participants had 20-29 mgs reduction in blood sugar level.In both experiment and control group 10% (3) of clients had 11-19 mgs reduction in blood sugar level. About 33.3% (10) of client had < 10 mg reduction of blood sugar level in control group but in experimental group3.3% (1) clients had < 10mgs reduction in blood sugar level.

Majority of control group 50% (15) of client had no reduction in their blood sugar level, but there was same reduction in experimental group . The result shows that the majority of experimental group clients 63.3% (19) had 30 mgs and above reduction in blood sugar level, but in control group the majority 50% (15) of clints had no reduction in blood sugar level.

The above findings reveals statistically significant reduction of blood sugar among experimental and control group (p = 0.001) in Type II Diabetic clients

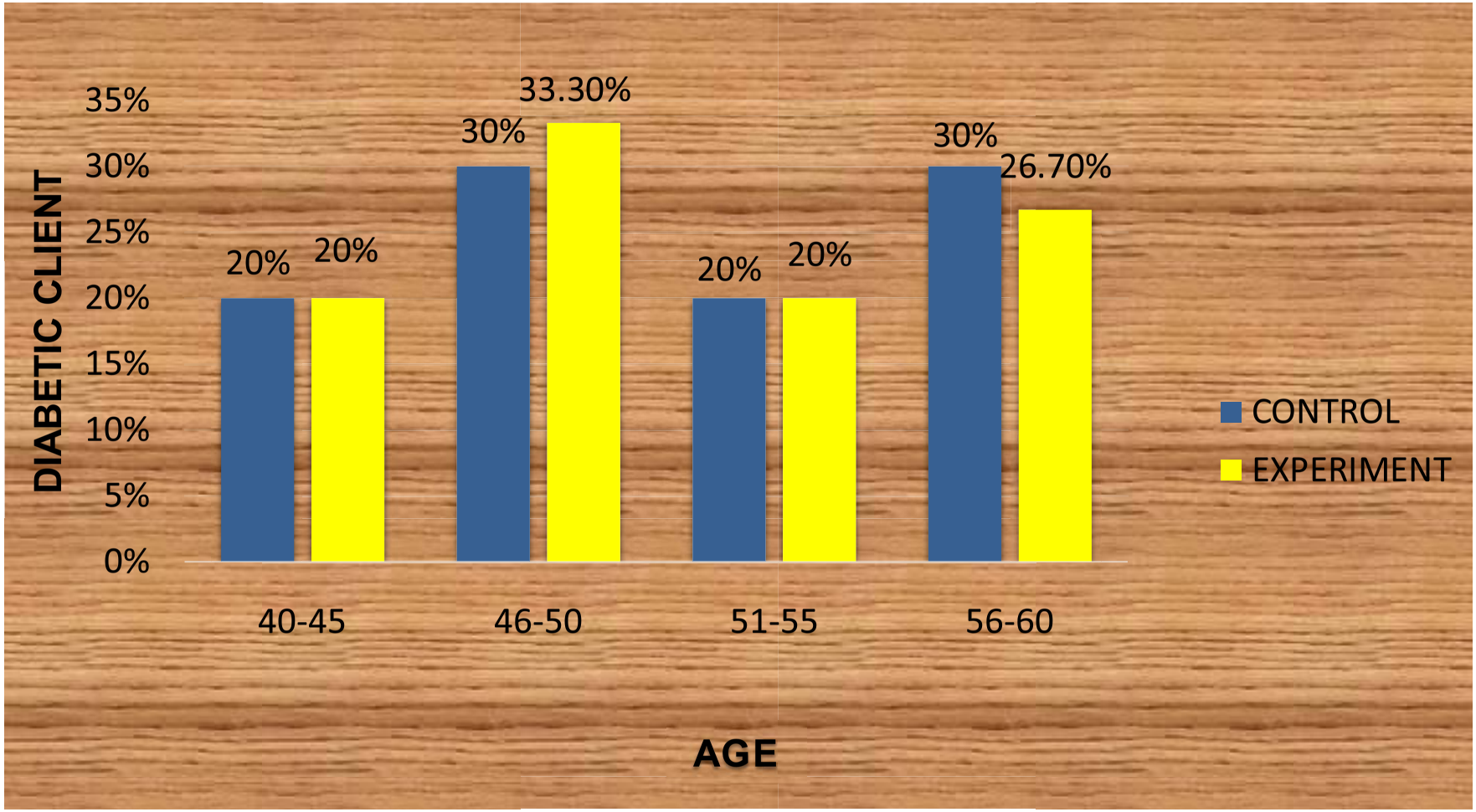

DIABETIC CLIENT
35%
30%
25%
20%
15%
10%
5%
0%
20%
20%
30%
33.30%
20%
20%
30%
26.70%
40-45
46-50
51-55
56-60
AGE
CONTROL
EXPERIMENT

Figure 3: Age wise distribution of Type II Diabetic client

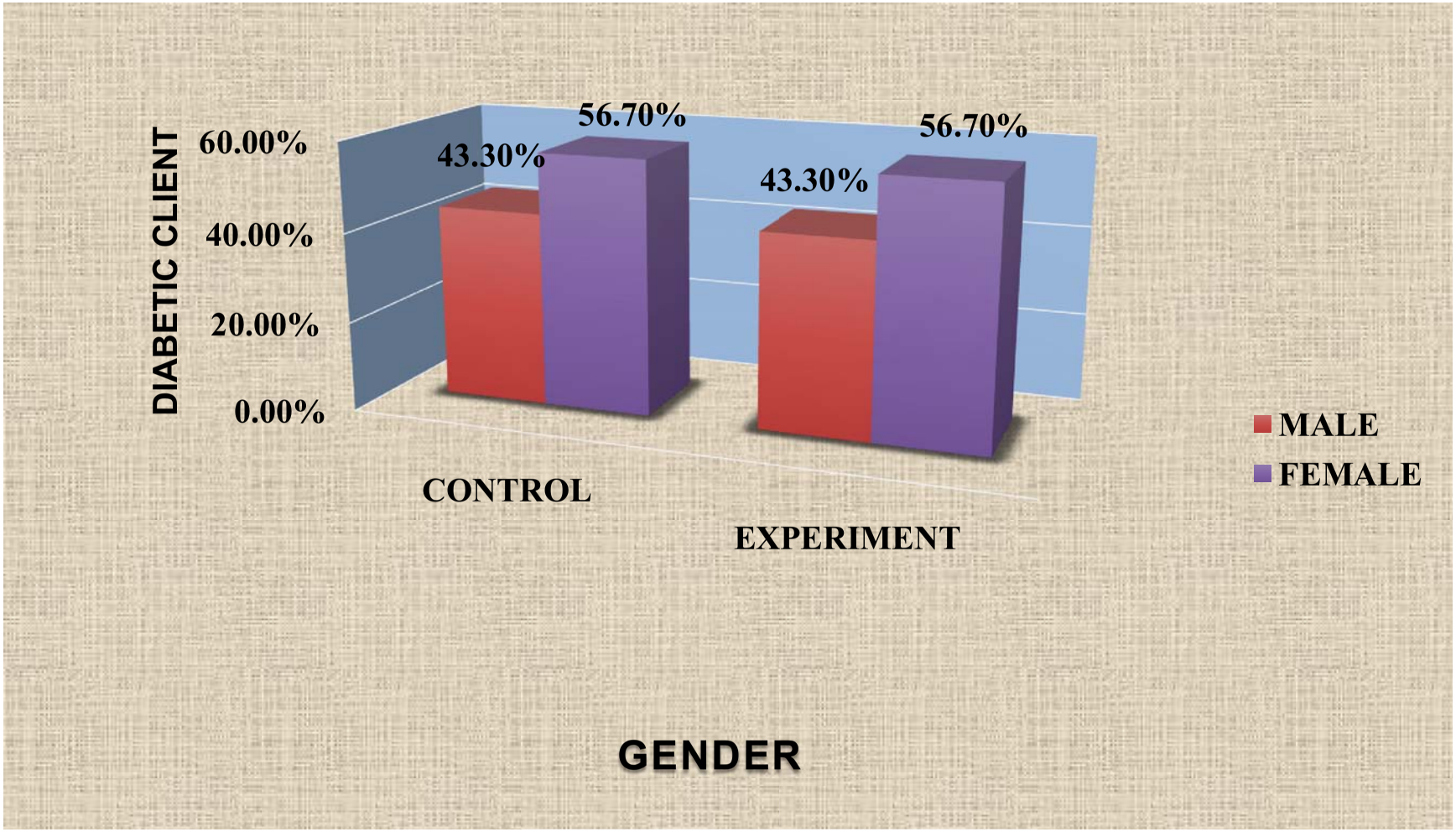

DIABETIC CLIENT
60.00%
40.00%
20.00%
0.00%
43.30%
56.70%
43.30%
56.70%
CONTROL
EXPERIMENT
MALE
FEMALE
GENDER

Figure 4 : Gender wise distribution of Type II Diabetic client

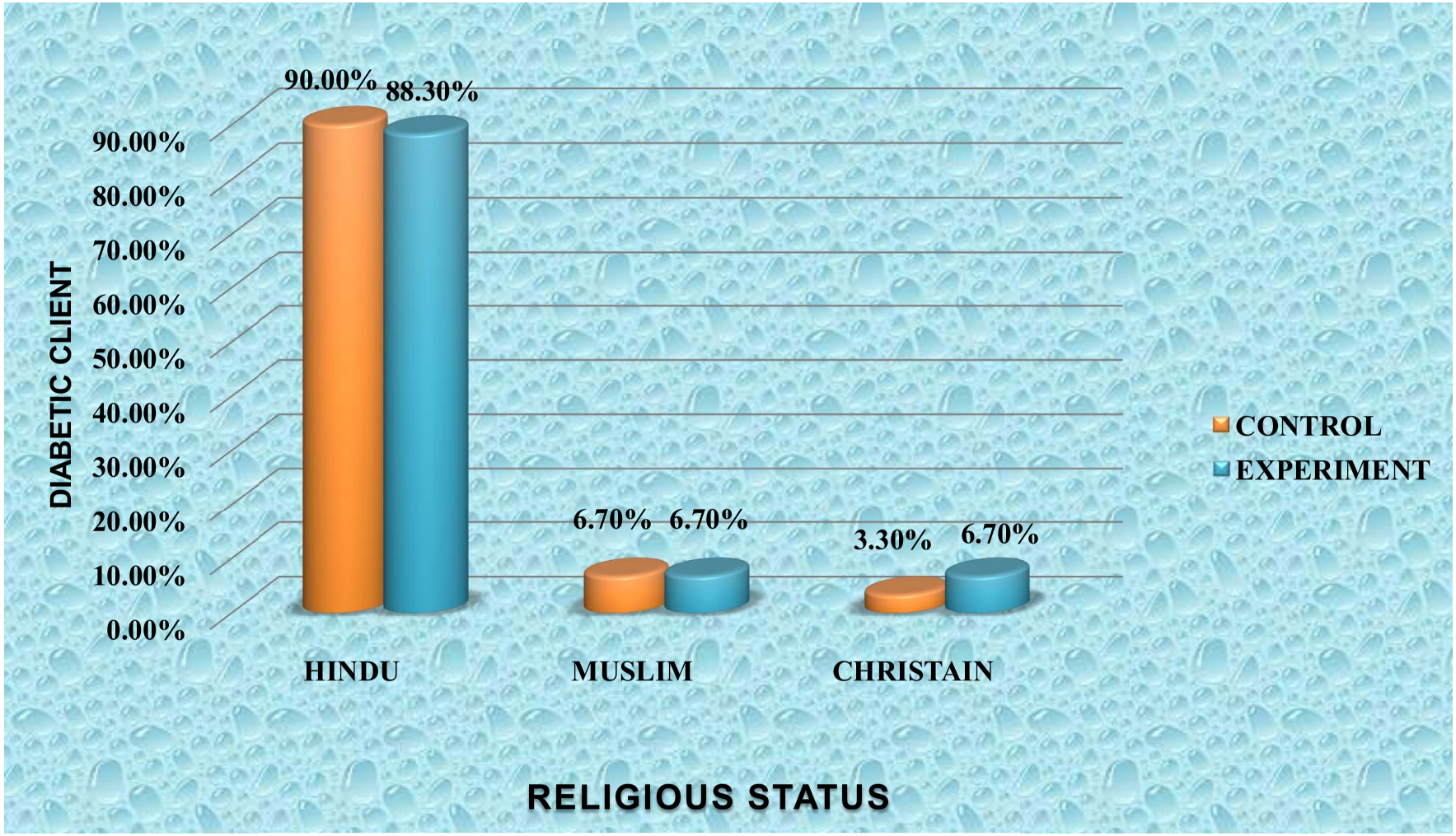

90.00%
88.30%
6.70%
6.70%
3.30%
6.70%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
DIABETIC CLIENT
HINDU
MUSLIM
CHRISTAIN
CONTROL
EXPERIMENT
RELIGIOUS STATUS

Figure 5 : Religion wise distribution of Type II Diabetic client

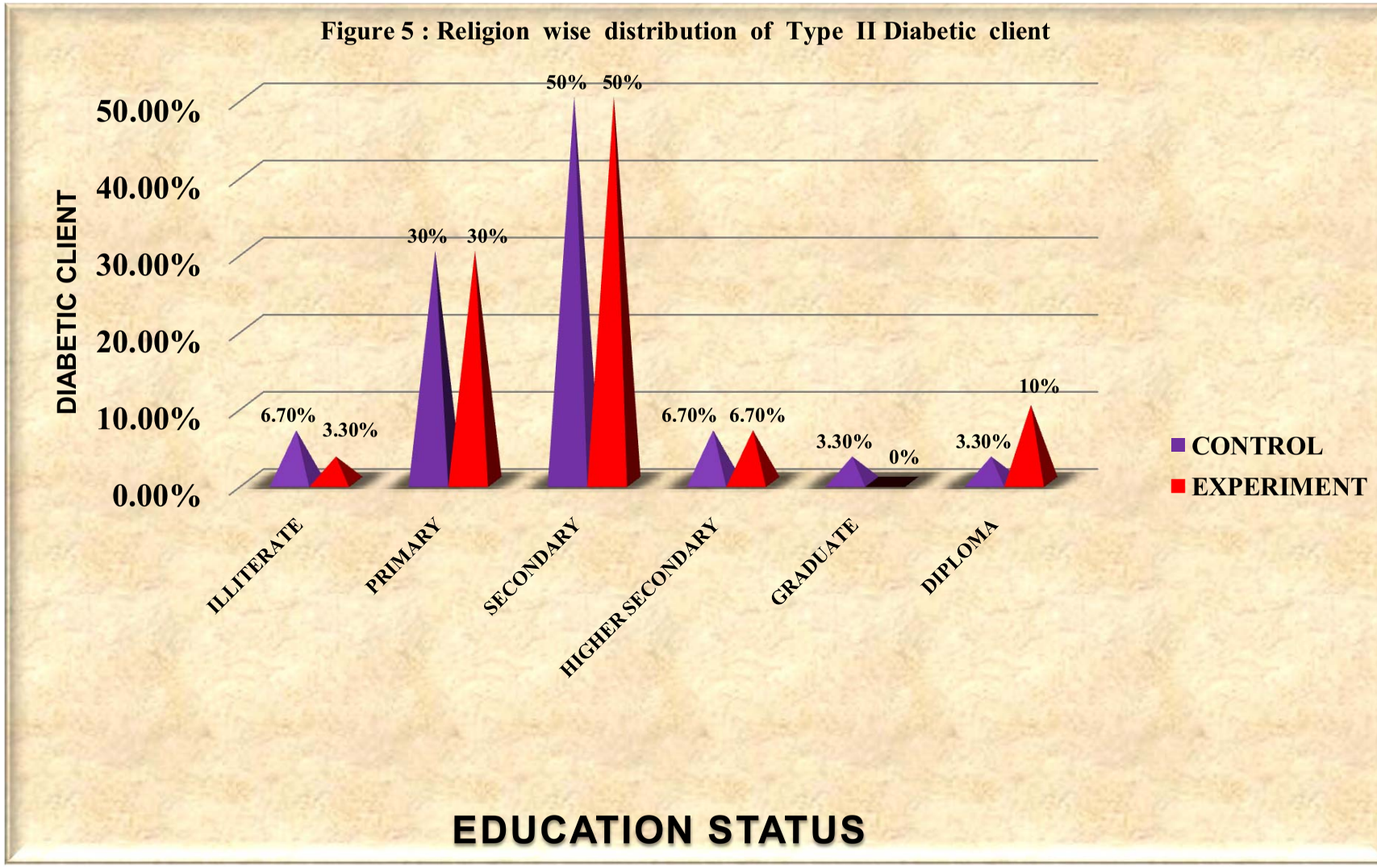


Figure 6: Education status wise distribution of Type II Diabetic client

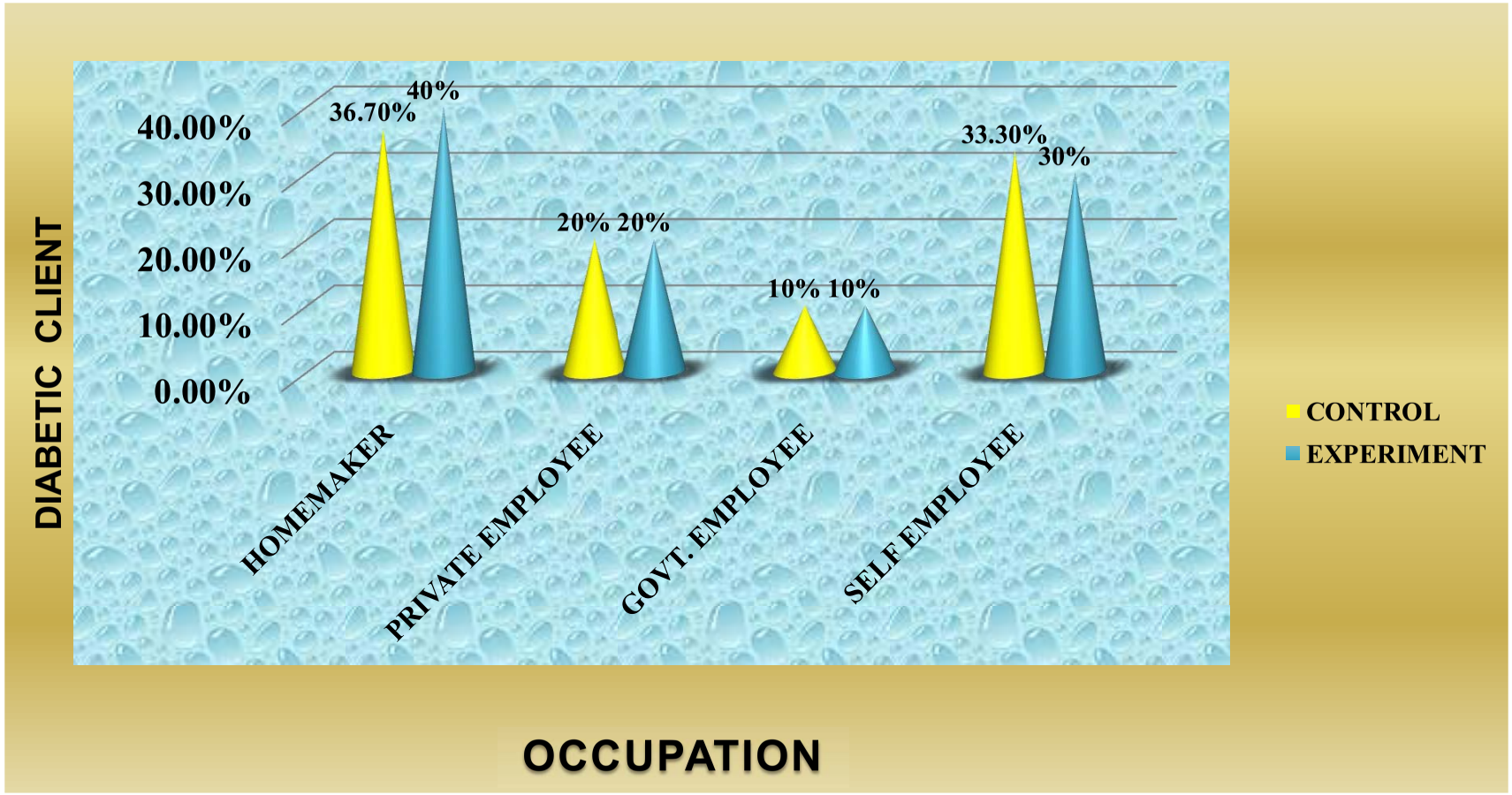


Figure 7: Occupation wise distribution of Type II Diabetic client

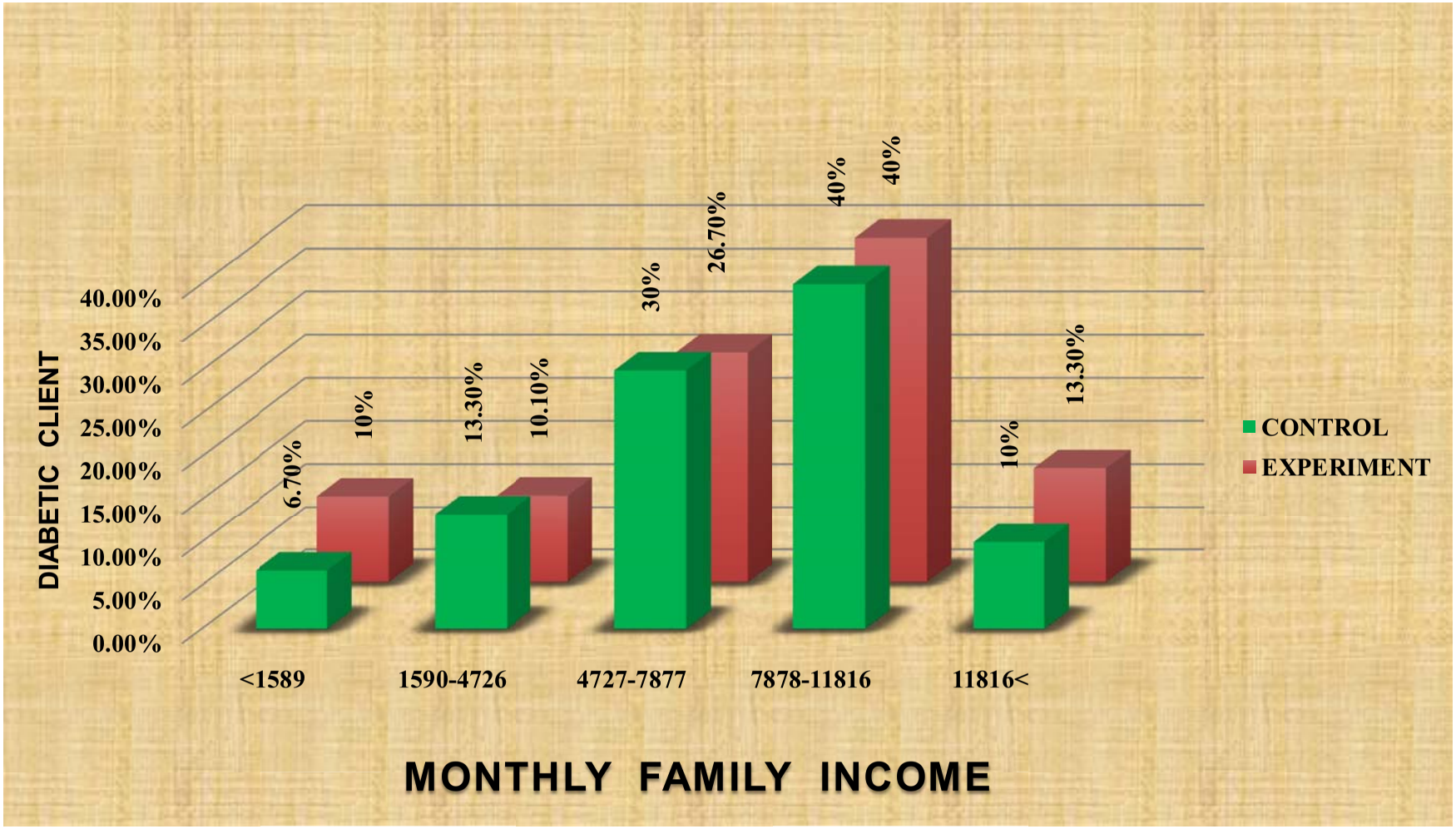

DIABETIC CLIENT
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
6.70%
10%
13.30%
10.10%
30%
26.70%
40%
40%
10%
13.30%
<1589
1590-4726
4727-7877
7878-11816
11816<
CONTROL
EXPERIMENT
MONTHLY FAMILY INCOME

Figure 8: Monthly family income wise distribution of Type II Diabetic client

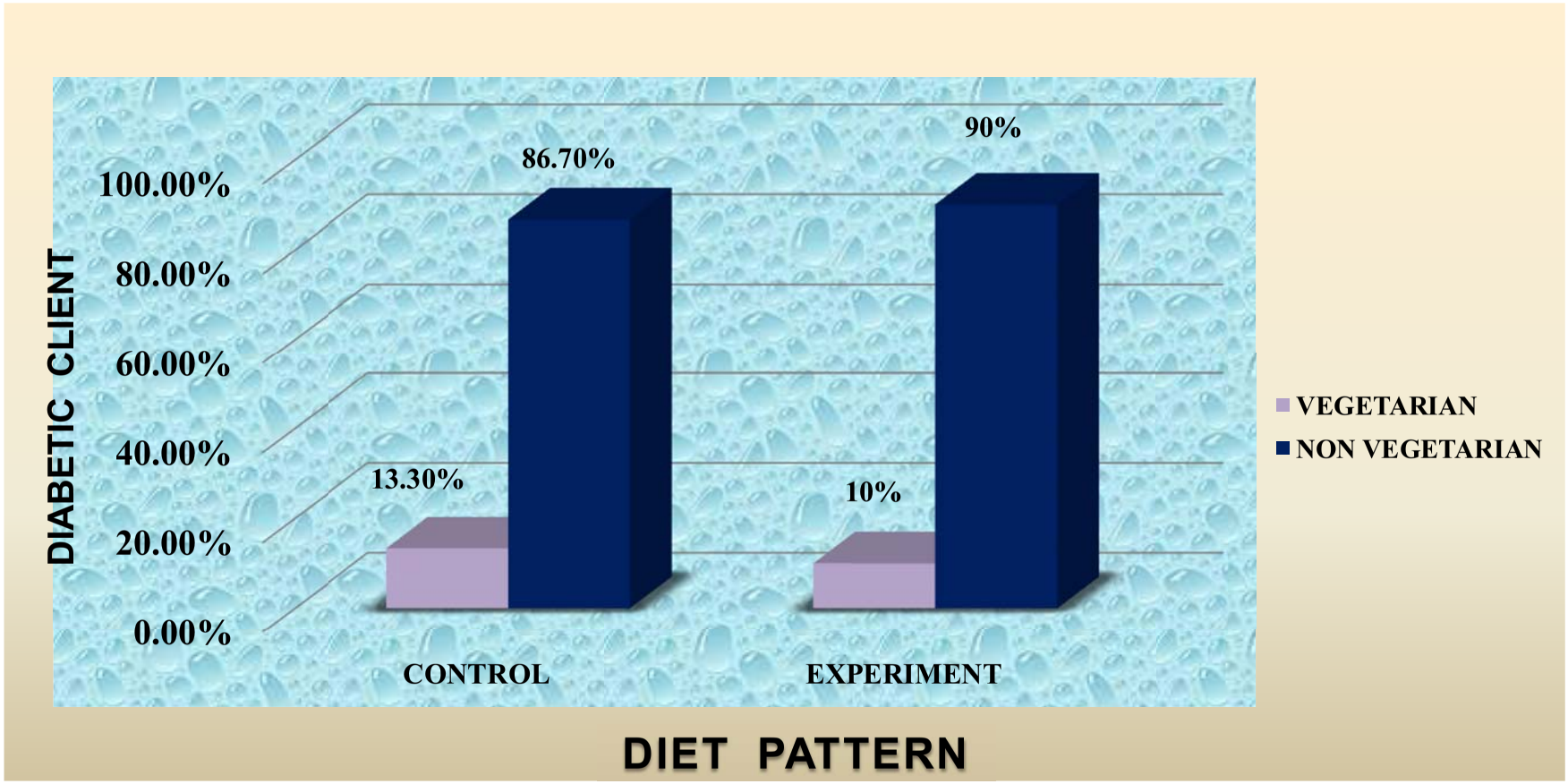


Figure 9 : Dietary pattern among study participants

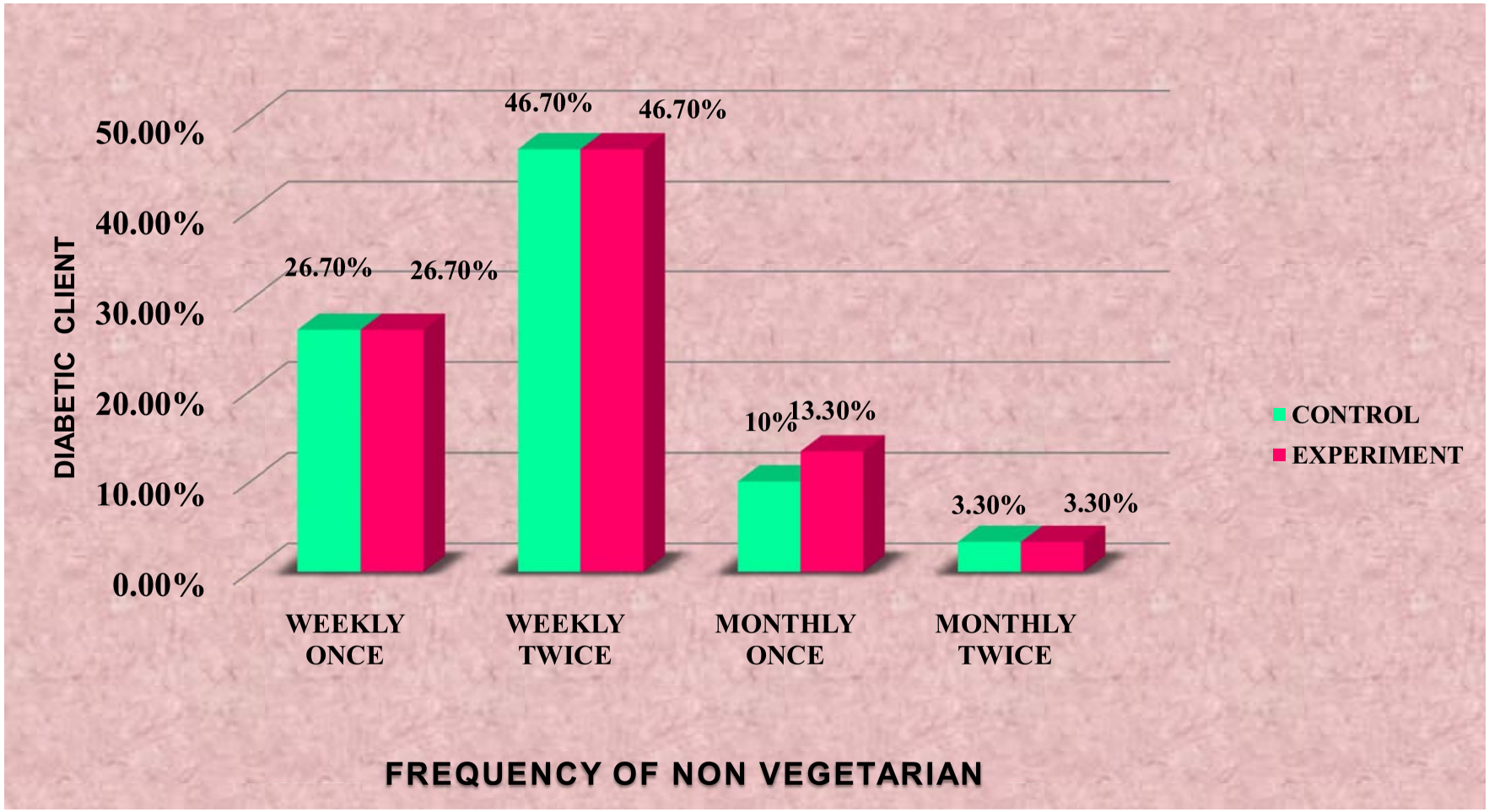

DIABETIC CLIENT
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
26.70%
26.70%
46.70%
46.70%
10%
13.30%
3.30%
3.30%
WEEKLY ONCE
WEEKLY TWICE
MONTHLY ONCE
MONTHLY TWICE
CONTROL
EXPERIMENT
FREQUENCY OF NON VEGETARIAN

Figure 10 : Frequency of Non – vegetarian among study participants

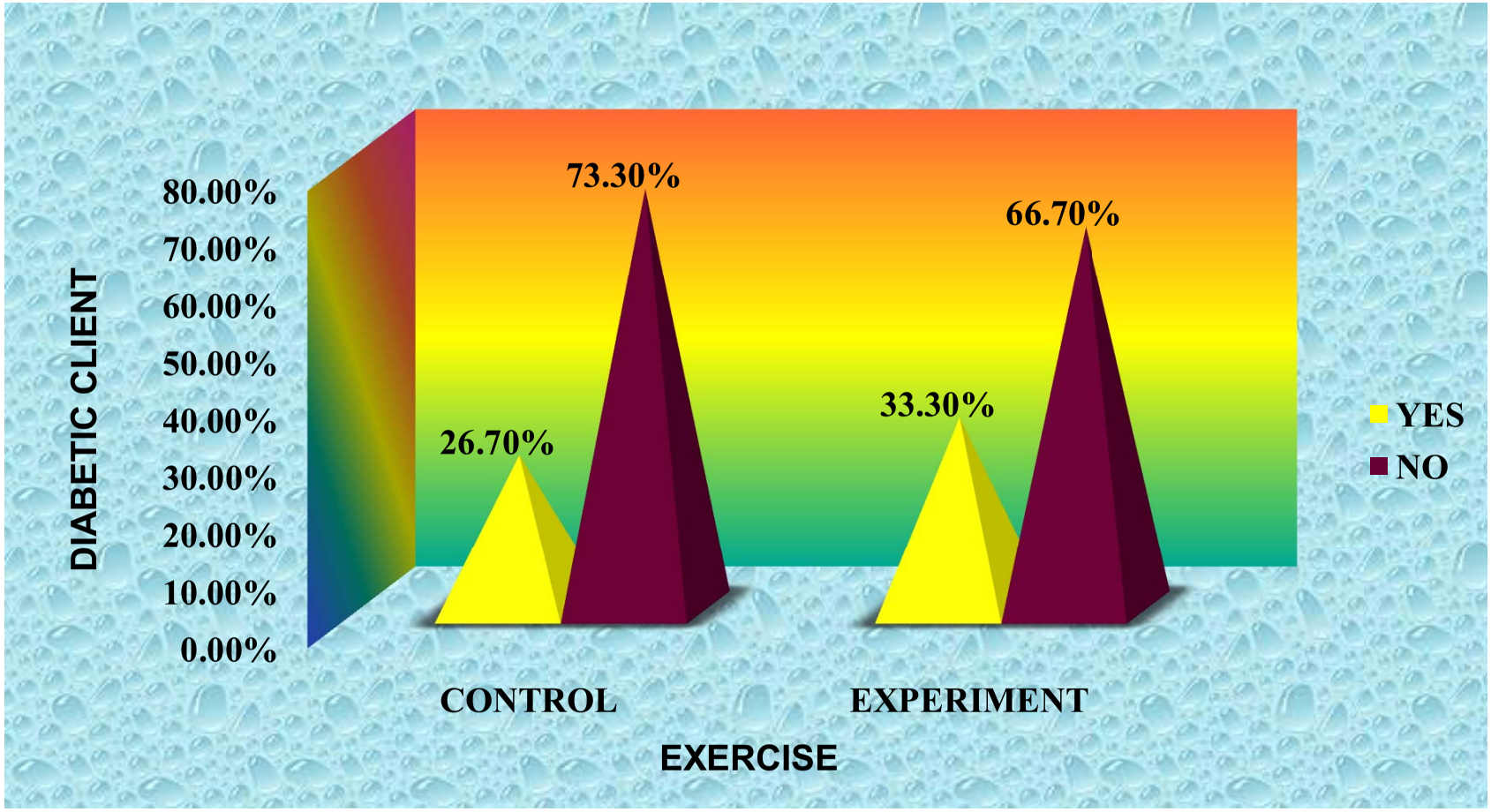


Figure11. Exercise habit among study participants

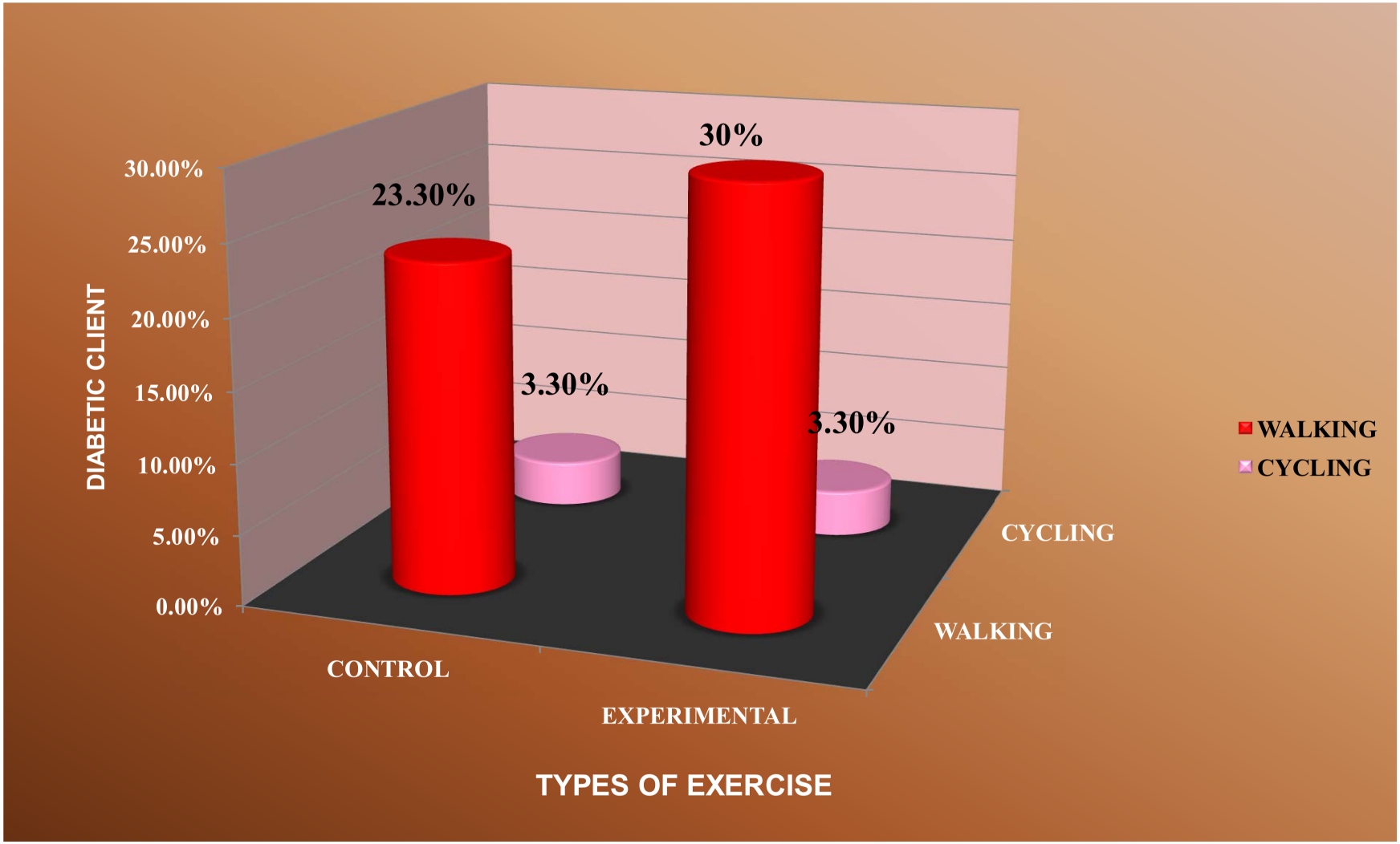

30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
DIABETIC CLIENT
23.30%
3.30%
30%
3.30%
CONTROL
EXPERIMENTAL
WALKING
CYCLING
CYCLING
WALKING
TYPES OF EXERCISE

Figure12. Types of exercise among study participants

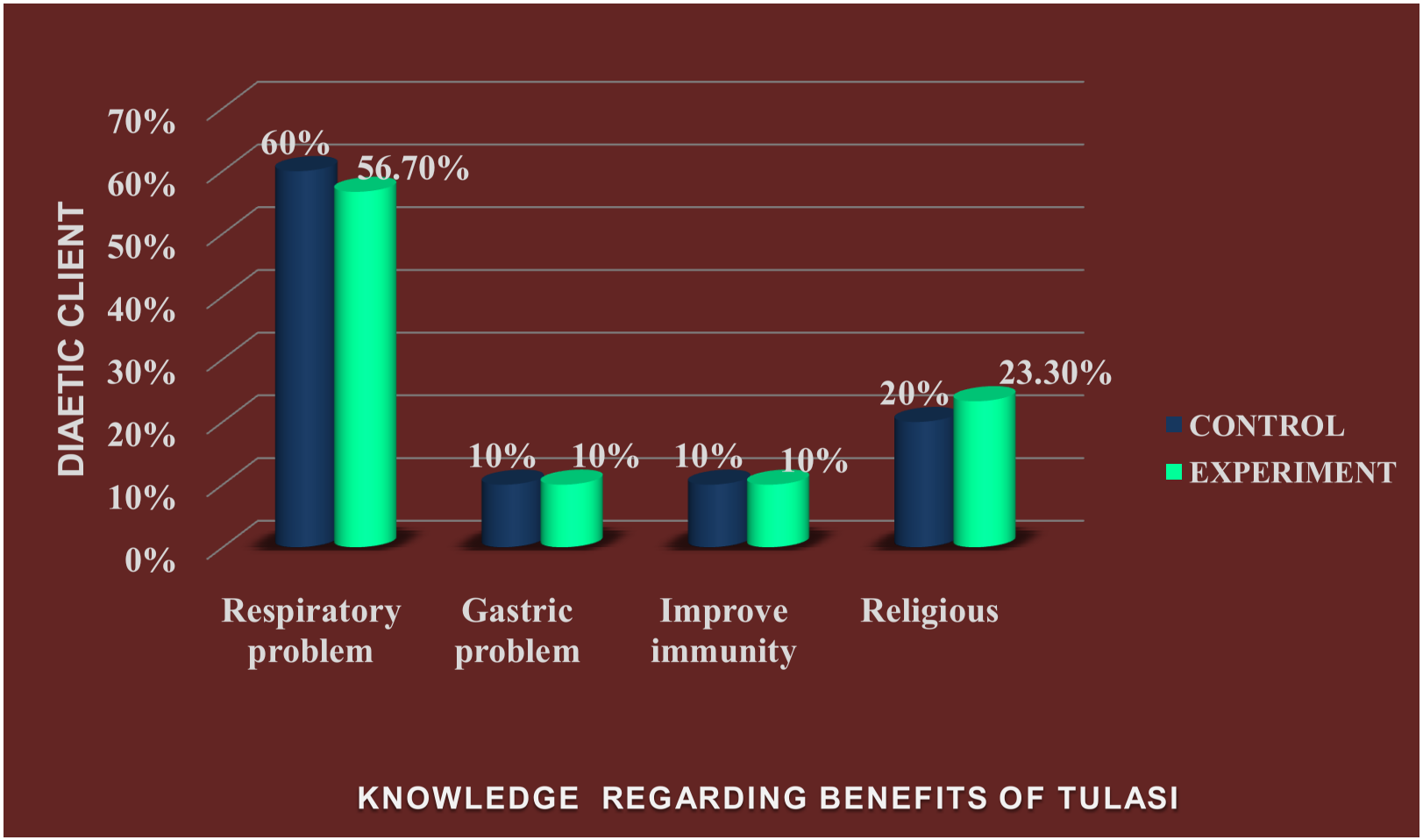


Figure13. Knowledge regarding benefits of tulasi among study participants

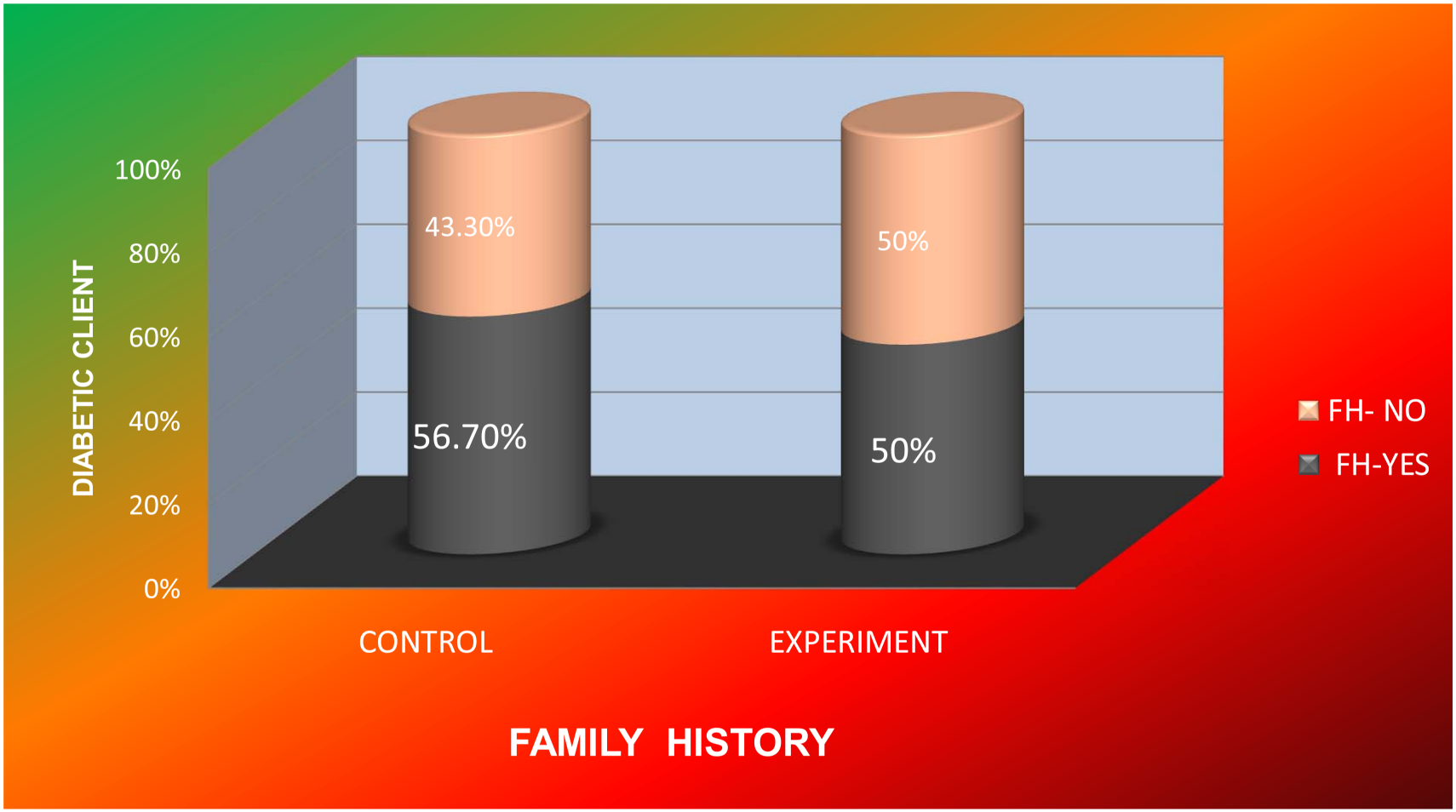

DIABETIC CLIENT
100%
80%
60%
40%
20%
0%
43.30%
56.70%
50%
50%
CONTROL
EXPERIMENT
FAMILY HISTORY
FH- NO
FH-YES

Figure14 : Family history of Diabetes mellitus among study participants

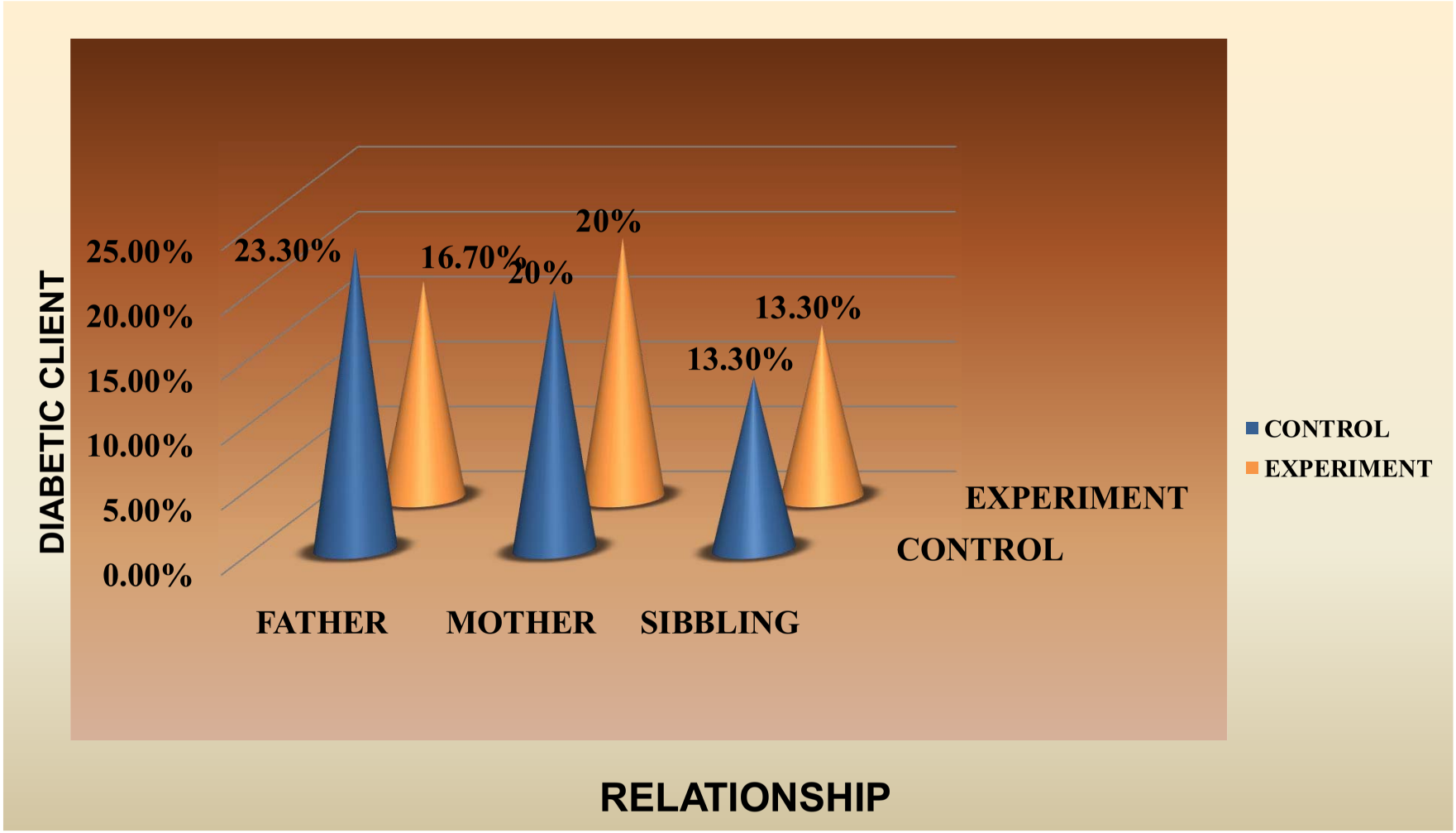

DIABETIC CLIENT
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
23.30%
16.70%
20%
20%
13.30%
13.30%
FATHER
MOTHER
SIBBLING
EXPERIMENT
CONTROL
CONTROL
EXPERIMENT
RELATIONSHIP

Figure15. Relationship of Family members having same diseases

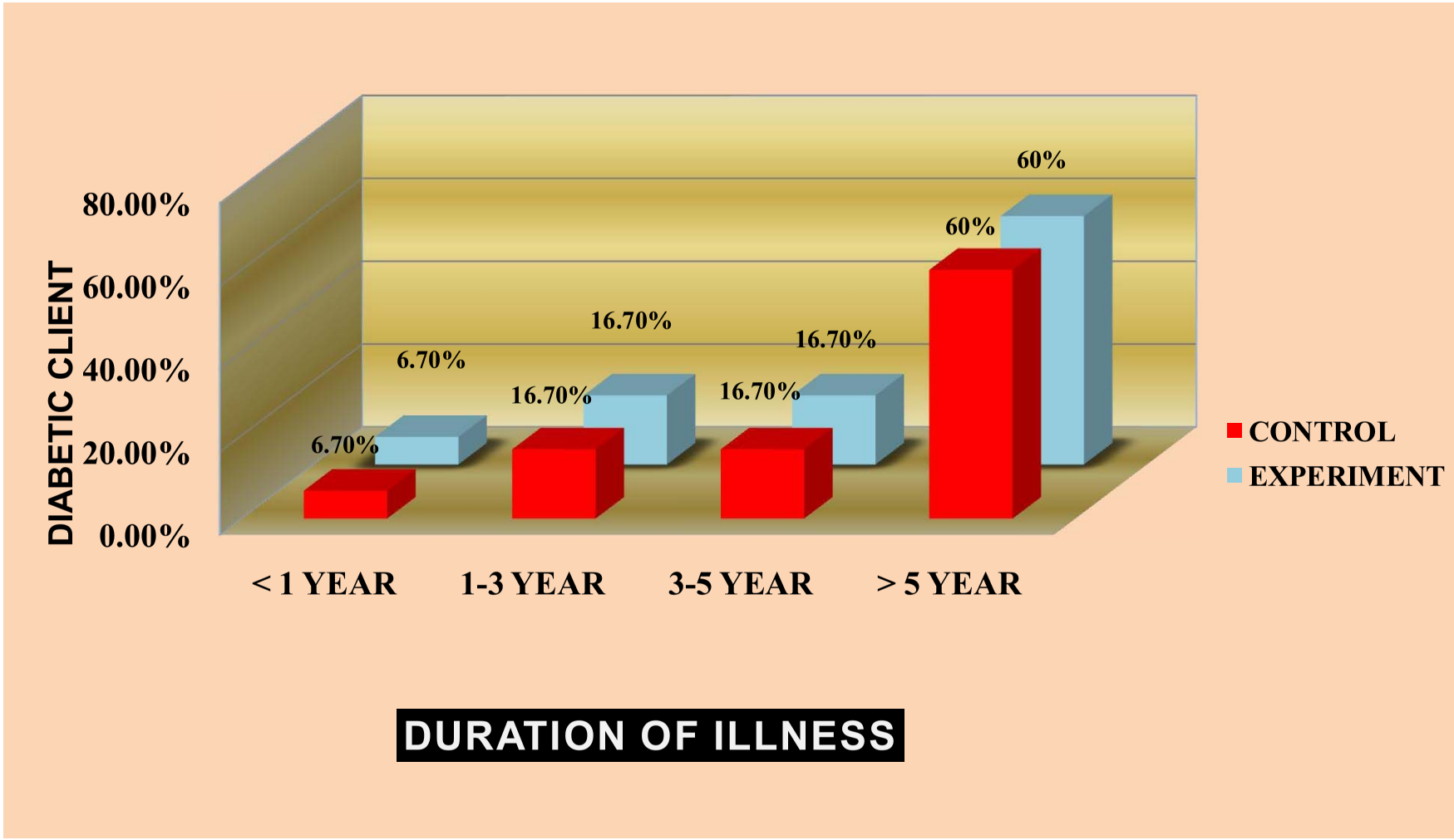

DIABETIC CLIENT
80.00%
60.00%
40.00%
20.00%
0.00%
6.70%
6.70%
16.70%
16.70%
16.70%
16.70%
60%
60%
< 1 YEAR
1-3 YEAR
3-5 YEAR
> 5 YEAR
CONTROL
EXPERIMENT
DURATION OF ILLNESS

Figure16. Distribution of duration of Diabetes mellitus

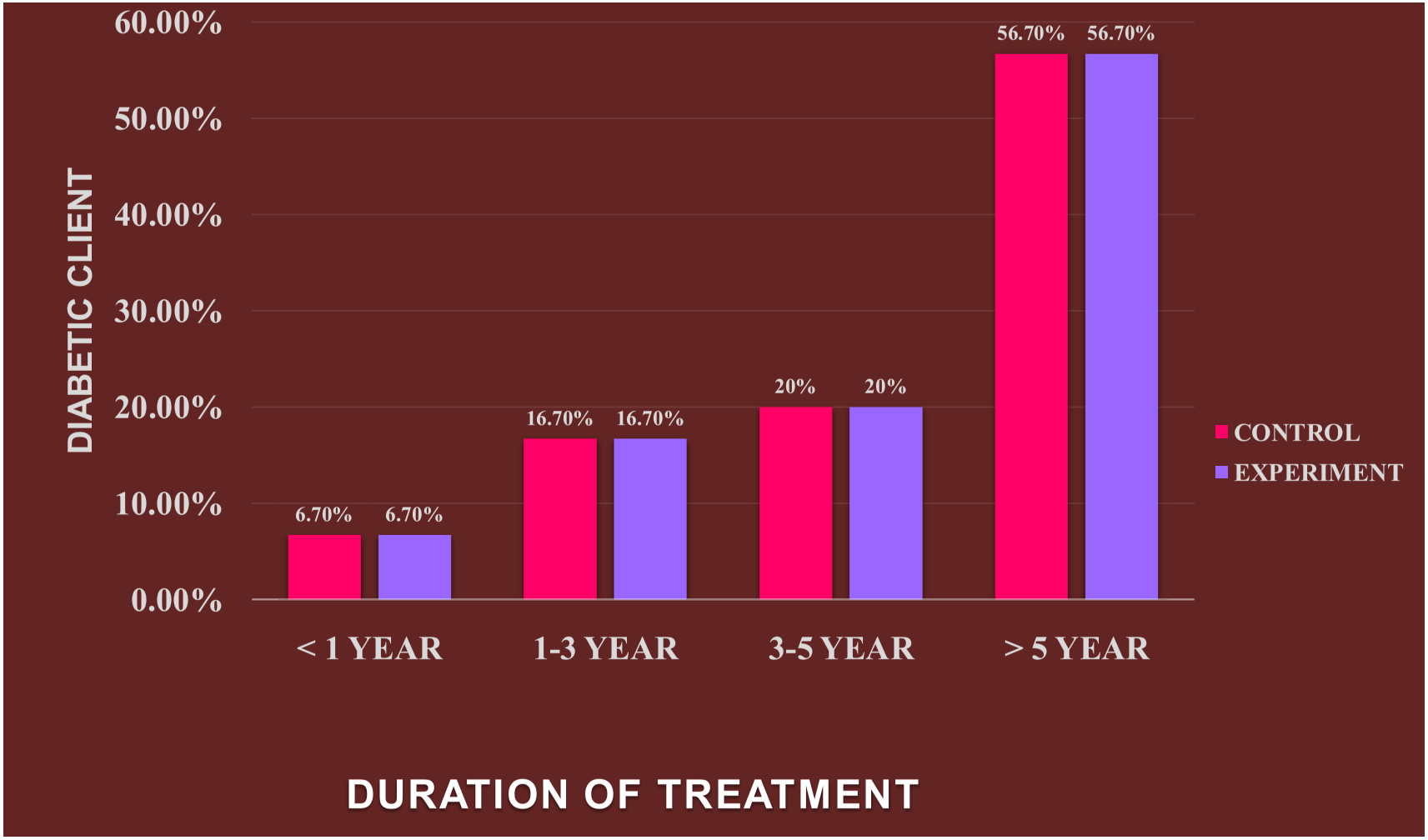

60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
DIABETIC CLIENT
6.70%
6.70%
16.70%
16.70%
20%
20%
56.70%
56.70%
< 1 YEAR
1-3 YEAR
3-5 YEAR
> 5 YEAR
CONTROL
EXPERIMENT
DURATION OF TREATMENT

Figure17. Duration of treatment among study participants

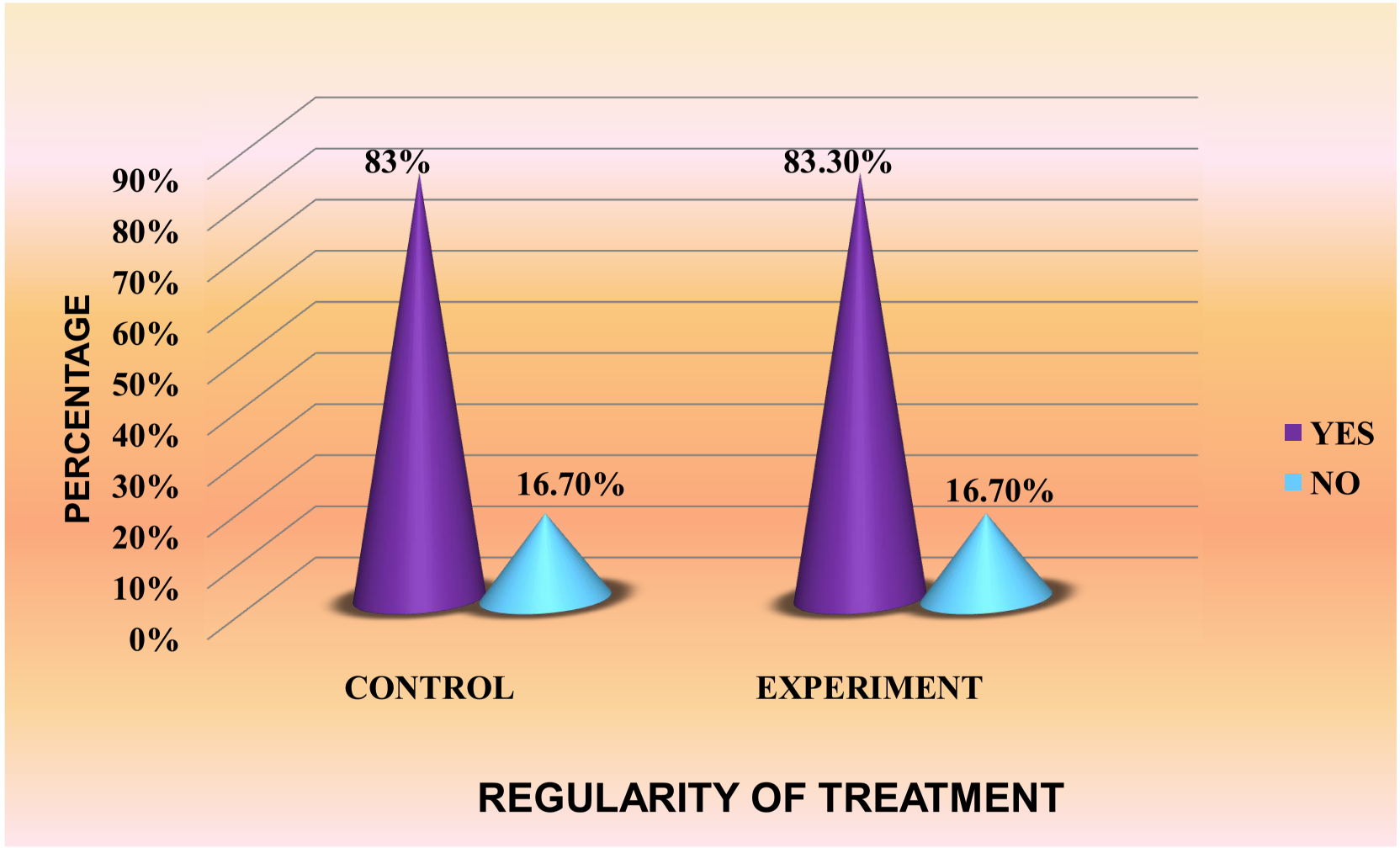

PERCENTAGE
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83%
16.70%
83.30%
16.70%
CONTROL
EXPERIMENT
YES
NO
REGULARITY OF TREATMENT

Figure18 : Treatment pattern of study participant

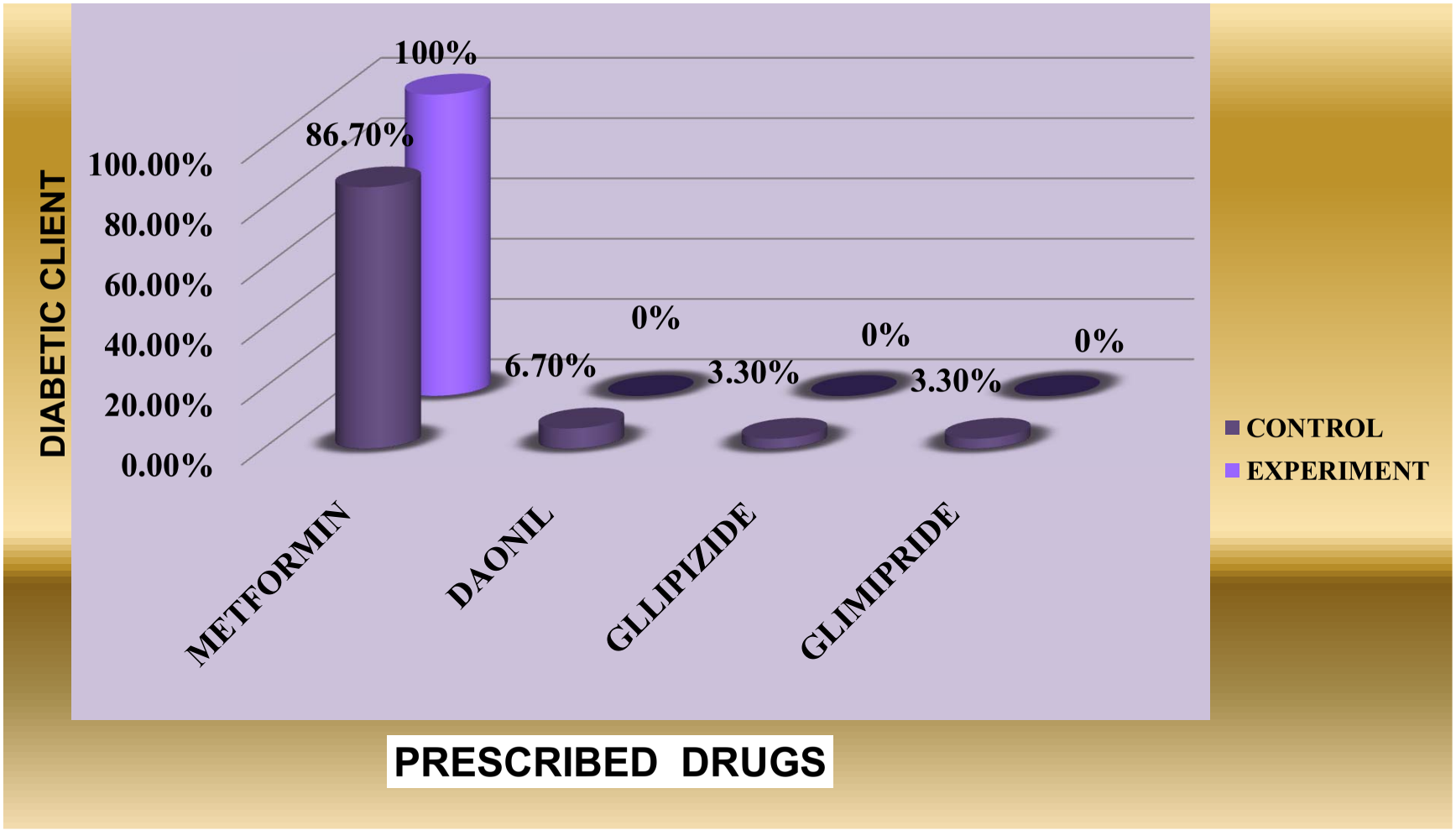

DIABETIC CLIENT
100%
86.70%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
6.70%
0%
3.30%
0%
3.30%
0%
METFORMIN
DAONIL
GLLIPIZIDE
GLIMIPRIDE
CONTROL
EXPERIMENT
PRESCRIBED DRUGS

Figure 19 : Types of prescribed drugs by study participants

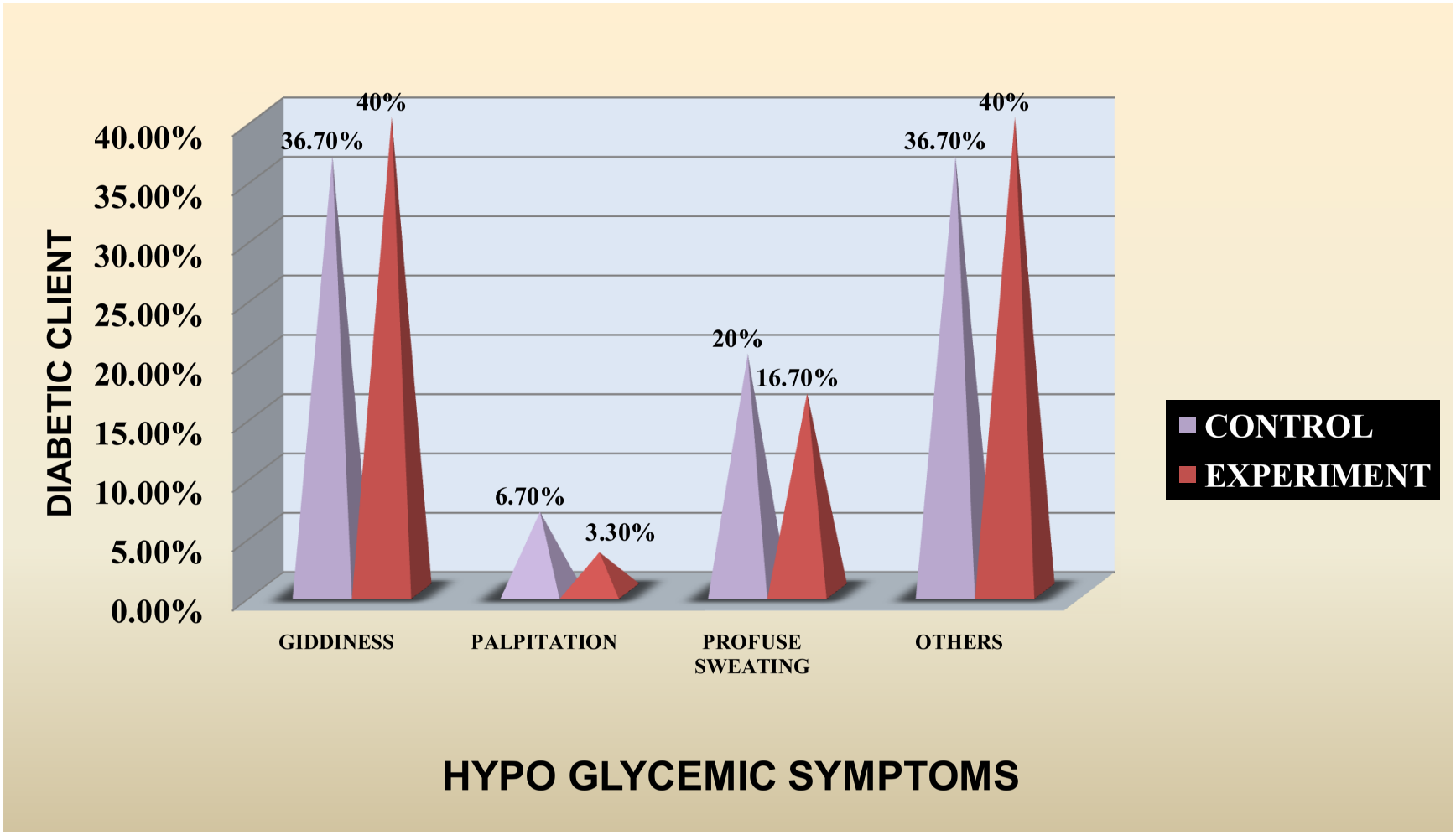

DIABETIC CLIENT
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
36.70%
40%
6.70%
3.30%
20%
16.70%
36.70%
40%
GIDDINESS
PALPITATION
PROFUSE SWEATING
OTHERS
CONTROL
EXPERIMENT
HYPO GLYCEMIC SYMPTOMS

Figure20 : Experienced hypo glycemic symptoms by study participants

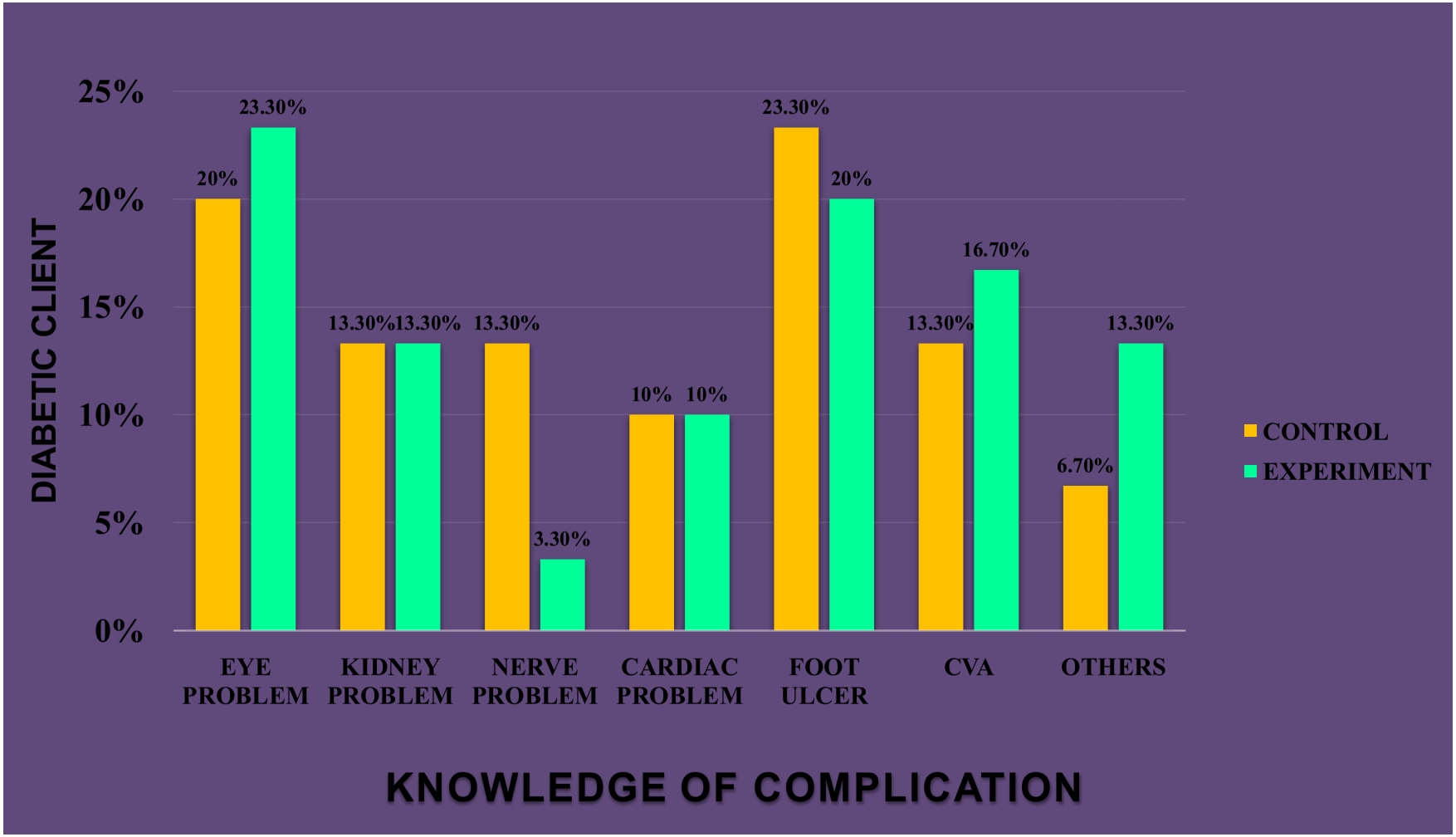

25%
20%
15%
10%
5%
0%
DIABETIC CLIENT
20%
23.30%
13.30%
13.30%
13.30%
3.30%
10%
10%
23.30%
20%
13.30%
16.70%
6.70%
13.30%
EYE PROBLEM
KIDNEY PROBLEM
NERVE PROBLEM
CARDIAC PROBLEM
FOOT ULCER
CVA
OTHERS
CONTROL
EXPERIMENT
KNOWLEDGE OF COMPLICATION

Figure21 : Clients knowledge on complication of diabetic

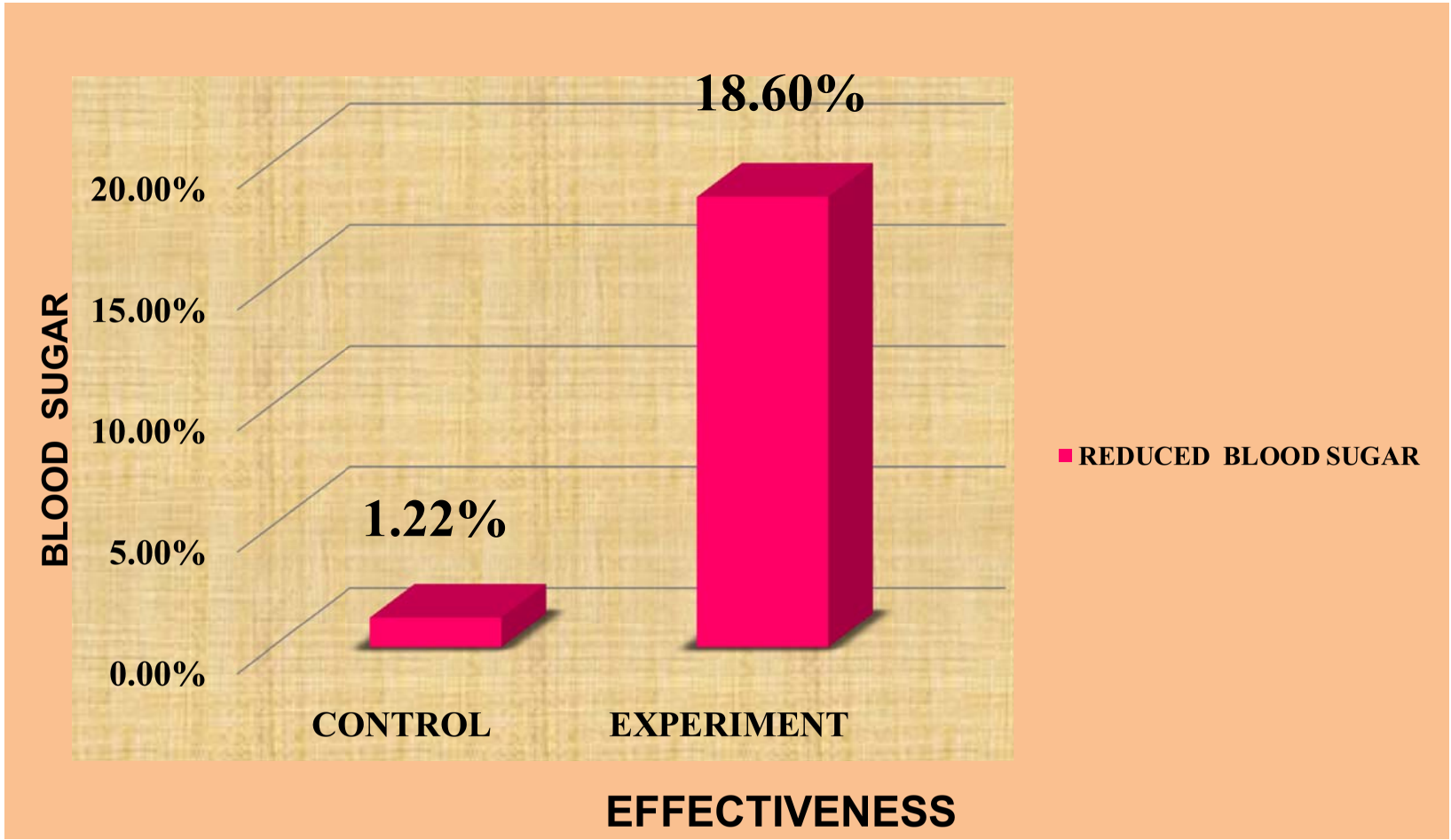

18.60%
20.00%
15.00%
10.00%
5.00%
0.00%
BLOOD SUGAR
1.22%
CONTROL
EXPERIMENT
EFFECTIVENESS
REDUCED BLOOD SUGAR

Figure 23 :Effectiveness of the study

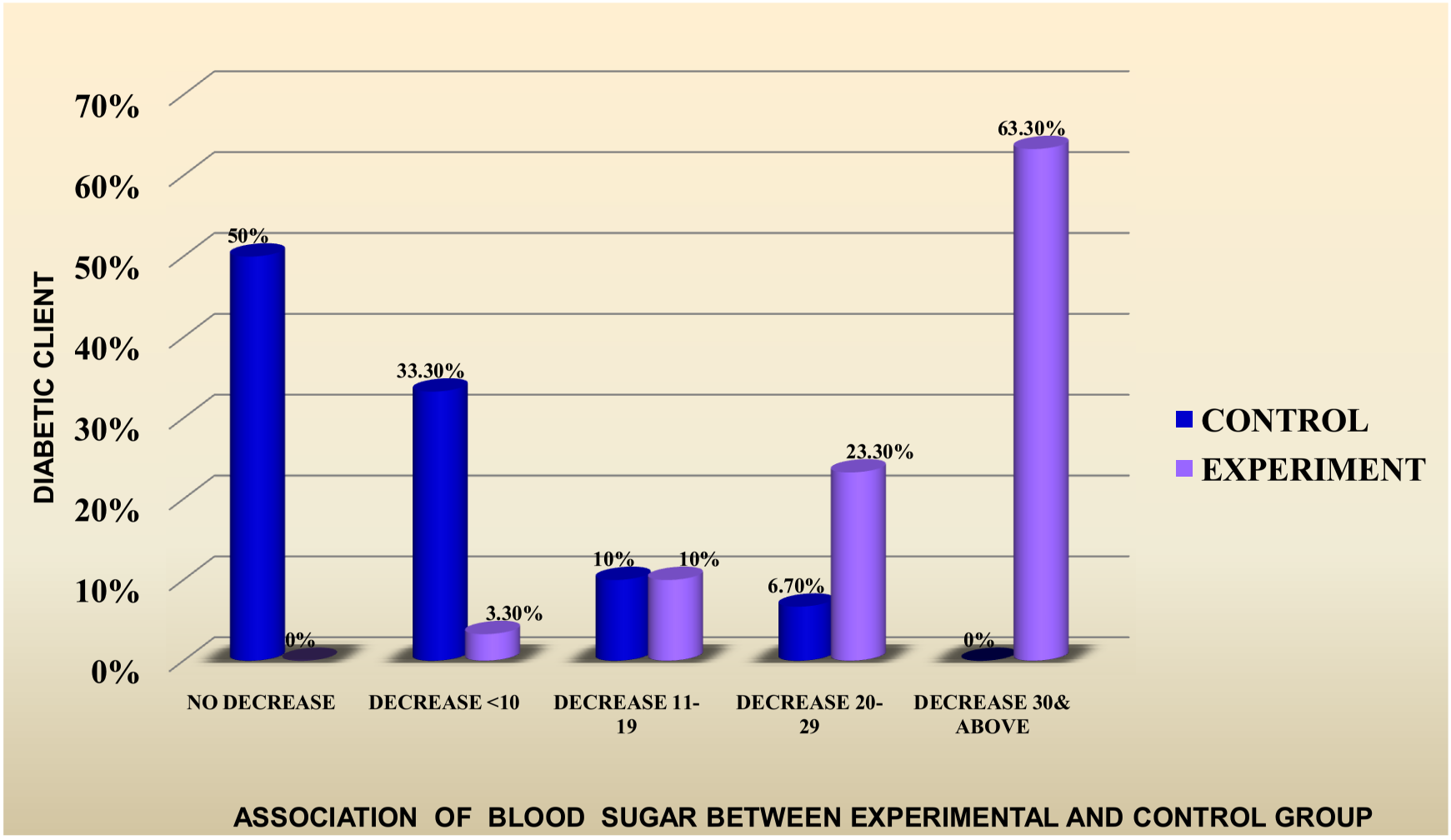

70%
60%
50%
40%
30%
20%
10%
0%
DIABETIC CLIENT
50%
0%
33.30%
3.30%
10%
10%
6.70%
23.30%
0%
63.30%
NO DECREASE
DECREASE <10
DECREASE 11-19
DECREASE 20-29
DECREASE 30& ABOVE
CONTROL
EXPERIMENT
ASSOCIATION OF BLOOD SUGAR BETWEEN EXPERIMENTAL AND CONTROL GROUP

Figure 24 : Association of reduction level of blood sugar between experiment and control group

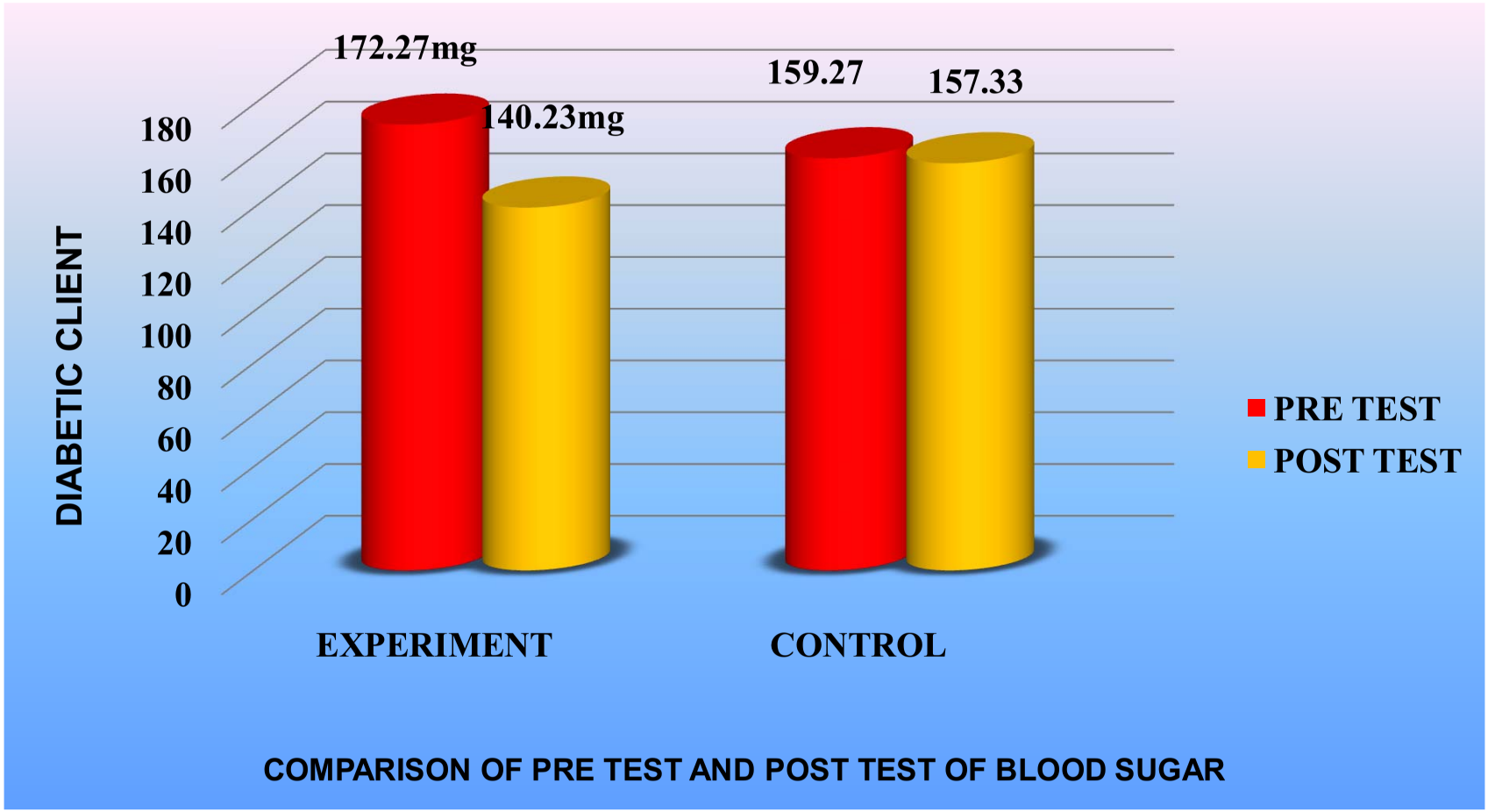
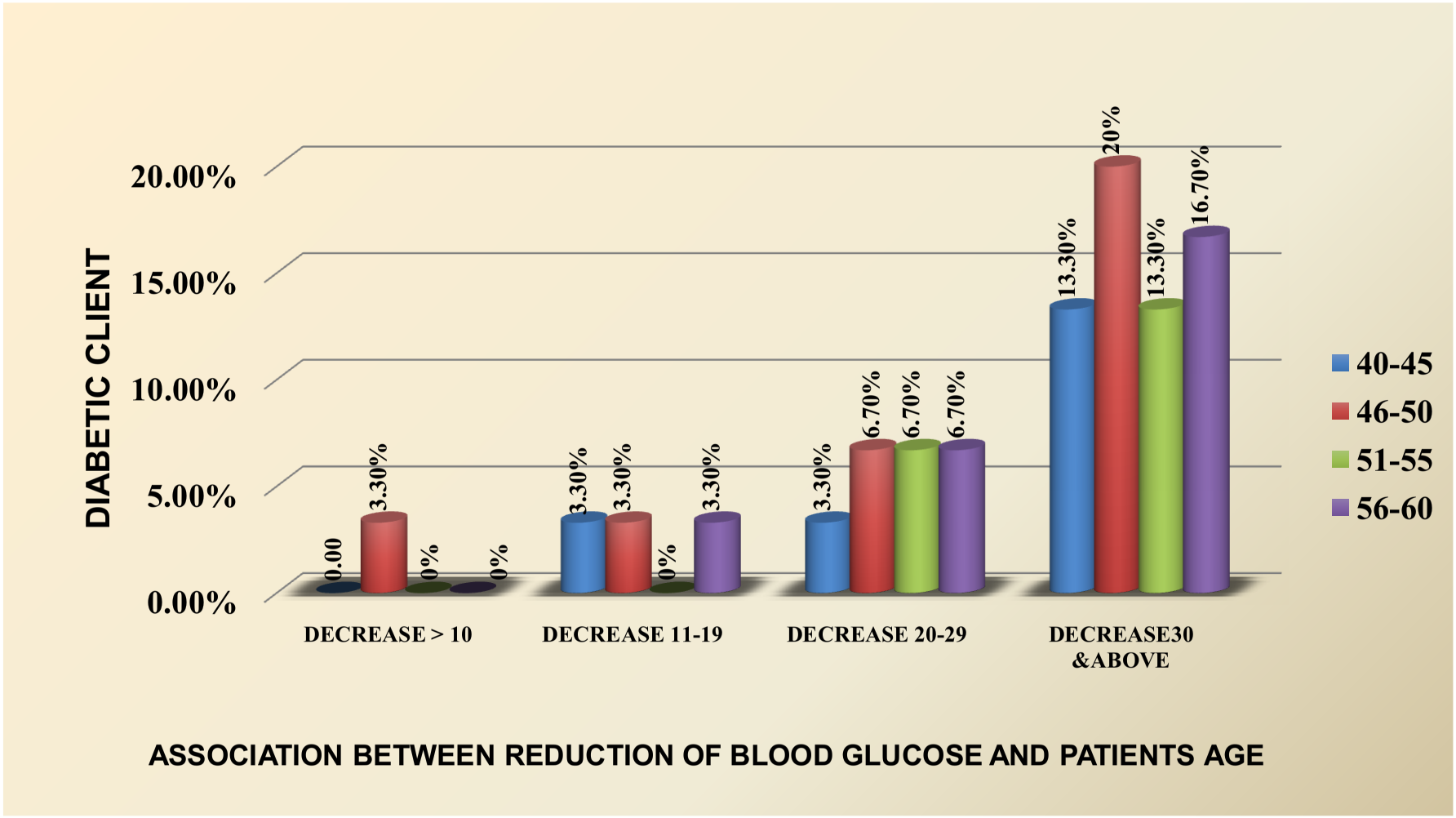

172.27mg
140.23mg
159.27
157.33
180
160
140
120
100
80
60
40
20
0
DIABETIC CLIENT
EXPERIMENT
CONTROL
PRE TEST
POST TEST
COMPARISON OF PRE TEST AND POST TEST OF BLOOD SUGAR

figure22 :. Comparison of pre test and post test of blood sugar level in experiment and control group



ASSOCIATION BETWEEN REDUCTION OF BLOOD GLUCOSE AND PATIENTS AGE

figure25. Association between reduction of blood glucose and patients age in experiment group

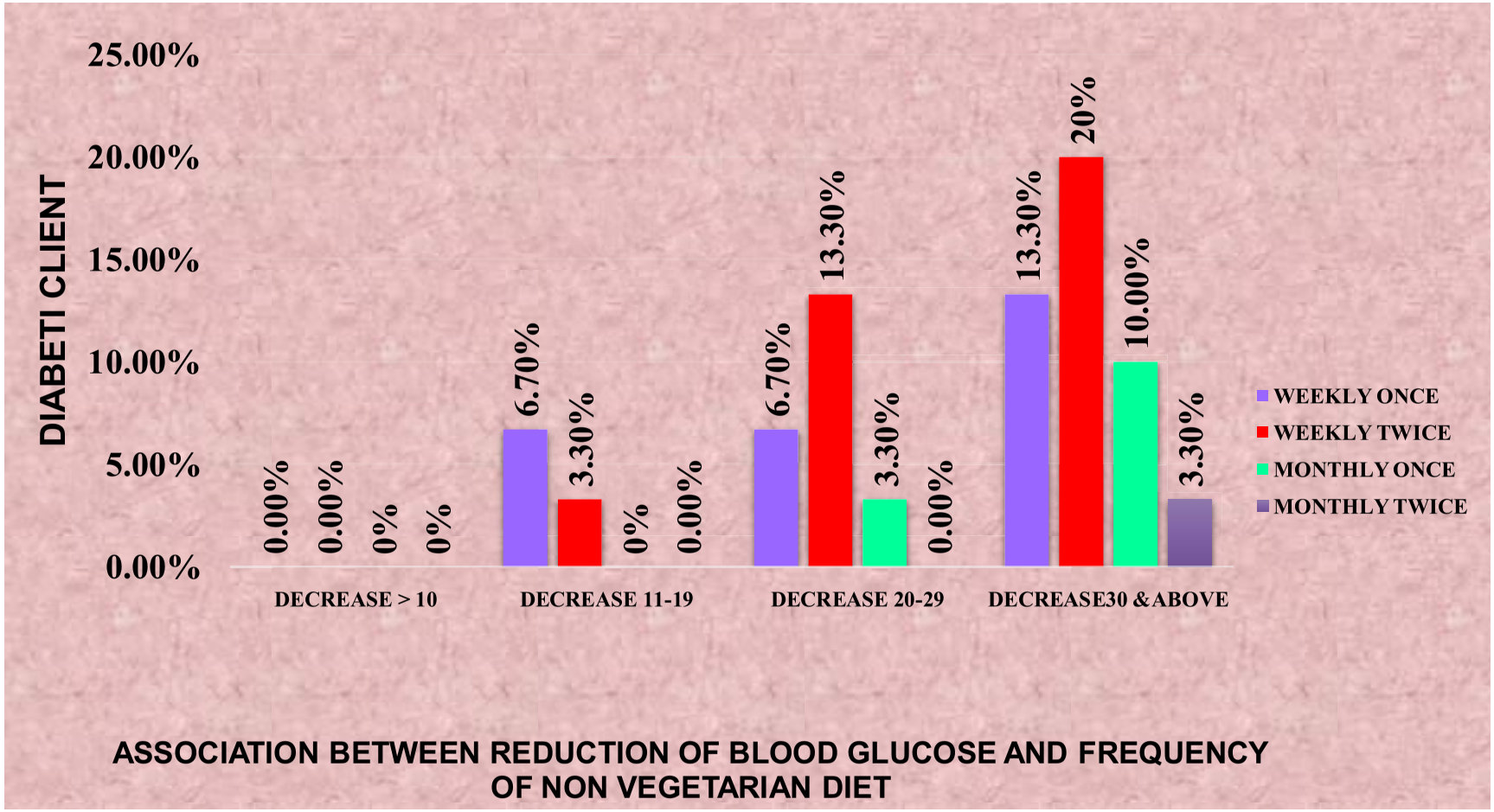

DIABETI CLIENT
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
0.00%
0.00%
0%
0%
6.70%
3.30%
0%
0.00%
6.70%
13.30%
3.30%
0.00%
13.30%
20%
10.00%
3.30%
DECREASE > 10
DECREASE 11-19
DECREASE 20-29
DECREASE30 &ABOVE
WEEKLY ONCE
WEEKLY TWICE
MONTHLY ONCE
MONTHLY TWICE
ASSOCIATION BETWEEN REDUCTION OF BLOOD GLUCOSE AND FREQUENCY OF NON VEGETARIAN DIET

figure26. Association between reduction of blood glucose and frequency of non vegetarian diet in experiment group

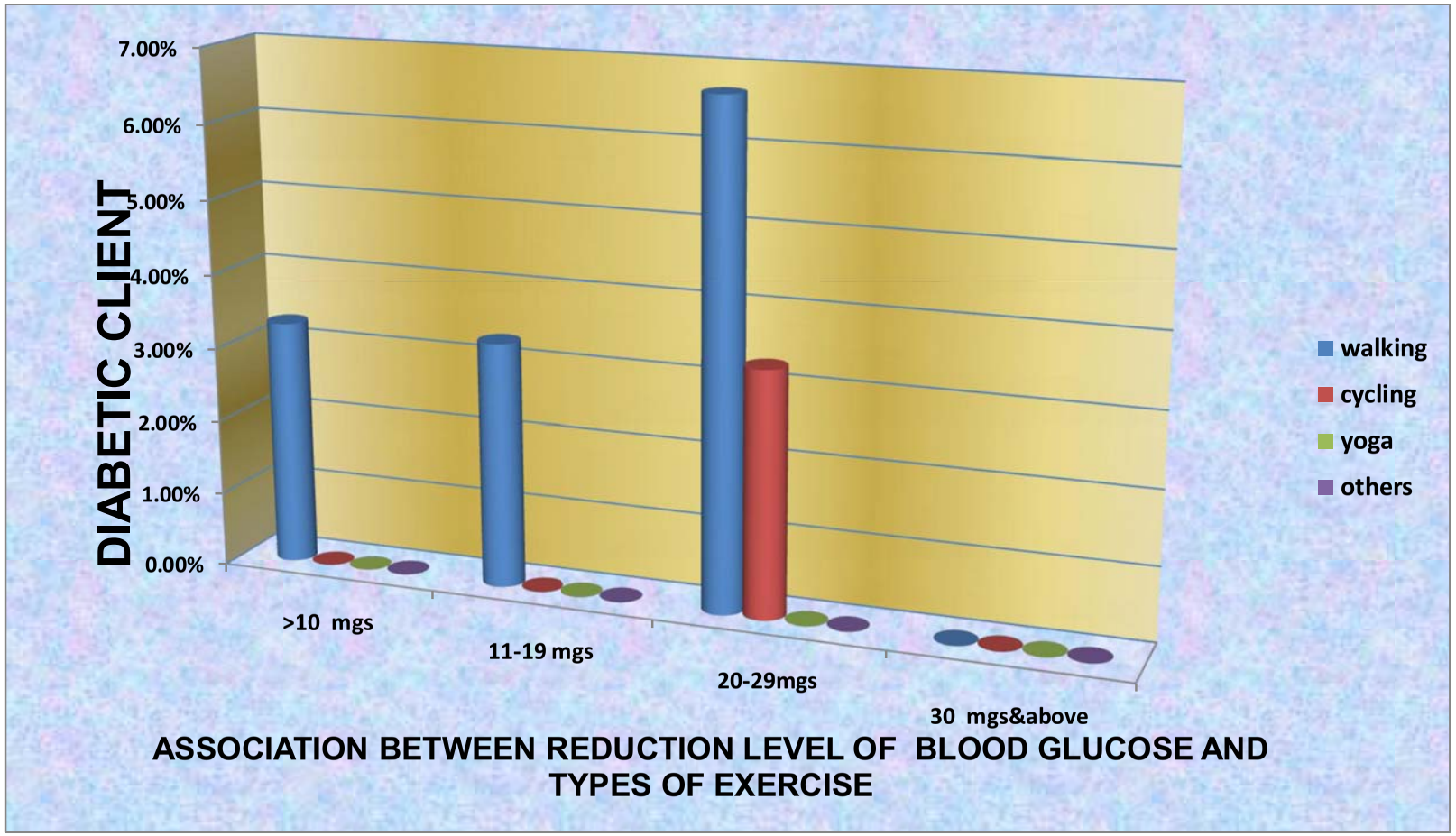


Figure27. Association between reduction of blood glucose and types of exercise in experiment group

CHAPTER V

SUMMARY OF RESULTS

MAJOR FINDINGS OF THE STUDY

Frequency and percentage distribution of demographic variables of Type II Diabetic Patients in experimental and control group were as follows:

- Most of the Type II Diabetic client 20 % (6) were in the age group of 40-45 years ,51-55years and 33.3%(10) were in the age group of 46-50 years, 26.7%(8) were in the age group of 56-60 years in Experimental group and in control group 20% (6)were in 41-45 years, 51 -55 years, and 30.0% (9) were in 46-50,55-60 years .

- Majority of them were females 56.7%(17) in both control and experimental group on the basis of religion most of them are Hindus 88.3%(26)in experimental and 90%(27) in control group. On the basis of occupation majority of them were home makers 40%(12) in experimental and 36.7%(11) in control group.

- Majority of the Type II Diabetic Patients 50.0%(15) in experimental and control group were educated up to secondary school level, very less percentage 3.3% (1) in experimental and 6.7% (2) in control group were have No formal education, 10% (3) in experimental and 3.3% (1) in control group were diploma holders, only 3.3% (1) in control group were graduate, same percentage of participants in both group 6.7% (2) were completed their higher secondary education .

- Majority of the diabetic clients 90% (27) in control group were non vegetarian, Among Type II Diabetic clients only 26.7%(8) in control group and 33.3% (10) in experimental group were following exercise in their daily activity, and majority of them 23.3%(7) in control and 30%(9) in experimental were doing walking.

- About 60% (18) of diabetic clients in control group and 56.7% (17) of diabetic clients in Experimental group are aware of benefits of tulasi in controlling respiratory problem
- Fifty percentage clients (15) in experimental, 56.7%(17) in control group were having family history of diabetes mellitus, and in that 23.3%(7) in control group and 50%(15) in experimental group members father had diabetes mellitus, and same percentage 20%(6) of participants' mother had diabetes mellitus, 60%(18) of experimental and control group participants were having diabetes more than 5 years, about 23.7%(7) of participants in both group have excessive thirst, hunger and urination.
- Among the type II diabetes clients around 56.7 %(17) of participants in both group are on medication above 5 years, and around 83.3 %(25) were on regular treatment. All the type II diabetic clients are taking allopathic medication among that 100 %(30) in experimental and 86.7 %(26) in control were taking Tab. Metformin,
- Majority of the participants experienced giddiness 40 %(12) in experimental and 36.7 %(11) in control group. Most of the participants 23.3 %(7) in experimental and 20 %(6) in control group believed complication of Diabetes mellitus is eye problem.

Effectiveness of Holy basil leaves extract on bothgroup among Type II Diabetic clients

- Average effectiveness of holy basil leaves in experimental was 18.6%,and the distribution found within 16.17% - 21.02%. But in control group average reduction was 1.22% , and the distribution found within 0.82% - 1.62%.
- The study reveals that there is 18.6% of reduction found in experimental group but in control group there is only 1.22%. Around 17.38% of reduction of blood sugar level in experimental group when compared with the control group. Thus the hypothesis was proved.

Comparision of pre test and post test assessment of blood sugar level in experimental and control group in Type II Diabetic clients

- On the pre and post assessment of blood sugar level in experimental group the result shows that the mean value of pre test was 172.27 and post test was 140.23 and standard deviation of pre test was 9.720 and post test was 14.330. and the correlation is 0.604.

Mean difference of Holy basil leaves extract on reduction of blood sugar level among experimental and control group

- In the difference of mean value (32.033) and SD (11.467) value , there is increase of 11.467 SD value when comparing the pre and post test blood sugar level .t=15.301 with df=29 and the p value is 0.000 it is statistically significant. there is increase of 11.467 SD value when comparing the pre and post test blood sugar level .t=15.301 with df=29 and the p value is 0.000 it is statistically significant

- The pre and post assessment of blood sugar level in control group the result shows that the mean value of pre test is 159.27 and post test is 157.53 and standard deviation of pre test is 11.715 and post test is 11.828 . and the correlation is 0.645

- The difference value of mean and SD between pre and post assessment of blood sugar level in control group. The difference of mean value (1.733) and SD (9.920) value , there is increase of 11.467 SD value when comparing the pre and post test blood sugar level .t=.957with df=29 and the p value is 0.346 it is statistically not significant.

Association between Holy basil leaves extract and demographic variables

- About reduction of blood sugar among both group 31.7% were Decrease 30 mgs & above, 15% were Decrease 20 -29mgs , 10 % were Decrease 11-19mgs, 18.3% were Decrease < 10 mgs and 25 % were no change in their blood sugar. The chi – square value is x^2= 44.141.

  p =0.001. It is statistically significant.

- The participants those who are taking regular treatment had more reduction in their blood sugar level. Their chi- square value is x^2 = 13.787 and p = 0.030. It is statistically significant. There is also a marked reduction in the group of participants those who are taking regular treatment more than 5 years. It shows the effectiveness of the study

CHAPTER VI

DISCUSSION

The result of the study was discussed based on the objectives and the following supportive studies

Objective : 1

The first objective of the study is to assess the pre test blood sugar level among Type II Diabetic Patients in experimental and control group.

In this study, the analysis reveals the pretest level of blood sugar among Type II Diabetic patients in experimental and control group. In experiment group the mean value of blood sugar level is 172.27 and in control it is 159.27, statistical calculation was assessed using student paired t-test.

Objective :2

The second objective of the study is to assess the post test blood sugar level among Type II diabetic clients in experimental and control group.

In this study, the analysis reveals the post test level of blood sugar among Type II Diabetic patients in experimental and control group. In experiment group the mean value of blood sugar level is 140.23 and in control it is 157.53, Statistical calculation was assessed using student paired t-test.

Objective : 3

The third objective is to compare the pre and post test blood sugar level among Type II diabetic clients in experimental and control group

On comparing the pre and post test blood sugar level in relation to intake of holy basil leaves among Type II Diabetic Patients in experimental group. The obtained mean ± SD values in experimental group the blood sugar level reduction was 32.03± 11.467 and the values of control group is 1.733± 9.920.The pretest and post test score was analyzed using mean difference with 95% confidence interval. The findings implies that there was a significant difference between blood sugar level before and after intervention. In regarding the mean score respectively from pre intervention to post intervention, depicts the effectiveness of the interventions, as the mean score decreased.

The overall finding of the study showed that the holy basil leaves was effective in reducing blood sugar level among Type 2 Diabetic patients in experimental group.

The assumption of the study was holy basil leaf extract may have some effect on blood sugar level is hereby accepted because the present study results also have proved that overall 17% of Type II Diabetic patients with high blood sugar levels in experimental group have improvement in reduction of blood sugar after the intervention of holy basil leaves for 15 days .

This study was supported by Dr. Beverly Yates, 2012,Naturopathic Physician conducted a study on holy basil leaves controlling hyperglycemia. In a study done with rats, the use of an extract of Ocimum sanctum resulted in the partial correction of diabetes-induced inhibited activity concerning 3 enzymes that are part of carbohydrate metabolism 13. The extract was dosed at 200 mg/kg for 30 days. The enzymes noted were glucokinase, hexokinase and phosphofructokinase. A plasma glucose decrease was also noted during this study (and observed in other animal studies as well). Reduction of fasting

blood sugar was observed with the addition of Ocimum sanctum leaf powder to the diet of diabetic rats; uronic acid and total amino acids were also reduced .

Objective : 4

The fourth objective is to assess the effectiveness of holy basil leaves extract among type II diabetic client in experimental and control group.

The mean blood sugar level of experimental group is 172.27 in pre test and 140.23 in post test. The mean difference is 32.04. but in the control group the mean difference is only 1.94 with 95% CI. So there is around 17.38% of reduction of blood sugar level in experimental group compared with control group.

This study was supported by ***Mushtaq ahmad, Rahmatullah qureshi, Muhammad arshad,Mir ajab khan and Muhammad Zafar, 2012,****Department of Plant Sciences, Quaid-i-Azam University, Islamabad, Pakistan.* A study to record the ethno medicinal uses of indigenous plants to control diabetes mellitus. During the survey, 37 plant species belonging to 33 genera and 23 Angiospermic families were discovered. The most dominant antidiabetic plant bearing family was Fabaceae (5 spp.) The inhabitants of the study area used different parts of plants and method of their uses. About 29 phytotherapies were investigated from the rural inhabitants of the area. These traditional recipes include extracts, leaves, powders, flour, seeds, vegetables, fruits and herbal mixtures.***Ocimum sanctum*** **L. Oc*imum album* L.:** Leaves of these plant species are dried under shade, then ground to make powder (*Safoof*). One gm power is given with water twice a day for prophylactic and the treatment of diabetes.

Hypotheses

H_1. There is a significant difference between pre test and post test blood

sugar level in experimental and control group.

In experimental group the mean value of pre – test blood sugar level is 172.27 and in control it is 159.27 and in experimental group the mean value of post – test bloodsugar level is 140.23 and in control it is 157.53 .so the hypothesis 1 is proved.

H_2. There is a significant association between the reduced blood sugar

level and selected demographic variables and clinical variables

among type II Diabetes Mellitus client.

The participants those who are non vegetarian are having more reduction in their blood sugar level p = 0.044. It is statistically significant. There is also a marked reduction in the group of participants those who are doing regular exercises. P = 0.042 it is statistically significant

So the hypothesis - 2 is proved.

.

CHAPTER-VII

CONCLUSION AND RECOMMENDATION

An experimental study with pre- test post- test control group research design was used to evaluate the effectiveness of holy basil leaves extract to reduce blood sugar level among Type II diabetic clients. Holy basil leaves extract is cost effective, easily available, can be used by all people daily and improves the general well being of the clients. It prevents, clients from developing complication and reduce the dosage of the drugs.

7.1 Nursing Implications

The implications of this study can be seen in areas of nursing practice, nursing education, nursing administration and nursing research.

7.1.1 Nursing Practice

- The community health nurse have a vital role in providing information for all the diabetic population.
- The community health nurse as a service provider should periodically organize and conducts mass education programme regarding diabetes awareness.
- Holy basil leaves are being cost effective and easily available which has high anti oxidants and effective in reducing the blood sugar level, the community health nurse must implement information education and communication (IEC) to create awareness to the community on the benefits of TULSI leaves.

7.1.2 Nursing Administration

- The community health nurse as an administrator should design formal teaching programme on diabetes mellitus and its prevention using pharmacological and various non-pharmacological and alternative system methods in reducing blood sugar levels in the community.

- ❖ The nurses posted in the Primary Health Centers for control and prevention of non-communicable disease should take active part in identifying the risk peoples and preventing the occurrence of disease in its earlier stage.

- ❖ She should organize for diabetes camps with collaboration with nursing students attending the Primary Health Centre and along with other NGO'S and it should be properly communicated to the public through mass medias.

- ❖ The diabetes training programme to be continued and opportunities must be provided to all the nurses for the effective training in control and prevention of diabetes mellitus.

7.1.3 Nursing Education

- ❖ As a nurse educators, we must strengthen the concept of non-pharmacological methods for management of diabetes mellitus.

- ❖ Nursing education should emphasize more on preparing the nurses to impart current changes in health information and to update the knowledge in all fields.

- ❖ Nursing curriculum to be equipped with knowledge regarding various health information and alternative therapy for non communicable diseases.

7.1.4 Nursing Research

Nurses should conduct periodic review of research findings and disseminate the findings through conferences, seminars and publication in professional, national and international journals and in the web site also. They have to update their knowledge in research by conducting nursing conferences and attending various workshops.

7.2 Limitations

The study was confined to a small number respondents and shorter period that limits the generalization.

7.3 Recommendations

- A comparative study can be conducted using holy basil leaves in control of Type II Diabetes mellitus among urban and rural people.
- A similar study can be conducted in other population like nurses, teachers, etc., in Chennai.
- This study can be replicated with larger samples for better generalization.
- The adolescent children should be educated by means of mass health awareness programs on diabetes mellitus.
- Help line to be provided to diabetic patients.

Conclusion

The study proved that holy basil leaves is effective in controlling blood sugar level in Fasting blood sugar level among Type II Diabetes Mellitus clients and prevents them from developing complications. As tulsi leaves is cheaper it can be used in all stratum of socio economic group peoples. It is one of the cost effective alternative source of reducing blood sugar level among Type II Diabetic clients in the community.

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No. 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Mrs. JEGANATHAN RA JESWARI,
M.Sc., (Nursing),
College of Nursing,
Madras Medical College,
Chennai – 600 003.

Dear Mrs. JEGANATHAN RA JESWARI,

The Institutional Ethics Committee has considered your request and approved your study titled **A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMONG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHOOLAI. No.35102014.**

The following members of Ethics Committee were present in the meeting held on 21.10.2014 conducted at Madras Medical College, Chennai-3.

1. Dr.C.Rajendran, M.D.,	: Chairperson
2. Dr.R.Vimala, M.D., Dean, MMC, Ch-3	: Deputy Chairperson
3. Prof.B.Kalaiselvi, M.D., Vice-Principal, MMC, Ch-3	: Member Secretary
4. Prof.R.Nandhini, M.D., Inst.of Pharmacology, MMC	: Member
5. Prof.K.Ramadevi, Director i/c, Inst.of Biochemistry, MMC	: Member
6. Prof.Saraswathy, M.D., Director, Pathology, MMC, Ch-3	: Member
7. Prof.S.G.Sivachidambaram, M.D., Director i/c, Inst.of Internal Medicine, MMC	: Member
8. Dr.Raghumani, M.S., Professor of Surgery, MMC	: Member
9. Thiru S.Rameshkumar, Administrative Officer	: Lay Person
10. Thiru S.Govindasamy, B.A., B.L.,	: Lawyer
11. Tmt.Arnold Saulina, M.A., MSW.,	: Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

1/11/14

Member Secretary, Ethics Committee

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the tool constructed by Ms.Jeganathan Rajeswari M.Sc. Nursing II year, College of Nursing, Madras Medical College which is to be used in her study titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMONG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHOOLAI".**has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

SIGNATURE WITH SEAL

Director
Institute of Community Medicine
Madras Medical College & RGGGH
Chennai - 600 003.

NAME : Dr. JOY PATRICIA PUSHPARANI, M.D.

DESIGNATION: Professor and H.O.D of community Medicine

COLLEGE : Madras Medical college, Chennai-03.

PLACE: Chennai-03.

DATE: 13.07.15

CERTIFICATE FOR CONTENT VALIDITY

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V. Ebigolda

SIGNATURE WITH SEAL

NAME : EBIGOLDA MARY.V

DESIGNATION: READER

COLLEGE : MADHA COLLEGE OF NURSING

MADHA COLLEGE OF NURSING
15 JUL 2015
CHENNAI - 600 069

PLACE: KUNRATHUR

DATE: 15-07-2015

From

Deputy Commissioner (Health)
Public Health Department
Corporation of Chennai
Ripon Building, Chennai-600003

To

The Principal,
College of Nursing,
Madras Medical College,
Chennai-600003

HD.Roc.No.C1/ 4158/2015 Dt. 23.07.2015

Dear Madam,

Sub: Corporation of Chennai-Public Health Department-College of Nursing-Madras Medical College - Requesting permission for MSc-II year Nursing students study proposed at community area Choolai, Chennai- permission orders issued - regarding.

Ref: Your Letter Dt.07.07.2015.

With reference cited above, the Corporation of Chennai is happy to grant you permission to a study to evaluate the following subjects in selected urban area at choolai.

S.No.	NAME OF THE STUDENT	DISSERTATION TOPICS
1	Jaganathan Rajeswari	A study to assess the efectioveness of holy basil leaves extract in reducing blood sugar amoung diabetes mellitus clients in selected urban area at Choolai.
2	Ramya.A	A study to evaluate the effectiveness of amla juice with honey in the control of bloold pressure among hypertensive client in seleted urban areat at Choolai
3	Sangeetha.V	A study to assess the effectiveness of soya milk with honey consumption on reducing physical and physiological symptoms amoung the post-menopausal women with in age group 40-60 years at Choolai
4	Visithra J	A study to assess and compare the effectiveness of fenugreek leaves with elemental iron and elemental alone on anemia among women residing in selected community at Choolai.

The permission for the study is granted with the following conditions.

1. The study should be conducted as per the request. The study should be conducted in one month, from the date of permission.
2. The Corporation of Chennai will not provide any monitory or human resources support for the study.
3. The details of the study should be submitted to the City Health Officer (i/c), Corporation of Chennai by the candidates before any formal publication.
4. No wrong reporting of Corporation of Chennai should be carried out.

Best wishes,

For Deputy Commissioner (Health) 2/2

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation work, "**A Study to assess the Effectiveness of Holy Basil Leaves Extract in reducing Blood sugar among Diabetes Mellitus clients in selected urban area at choolai**" done by Ms. Jeganathan Rajeswari II year M.Sc (Nursing) student of College Of Nursing, Madras Medical College,Chennai-3 is edited for English language appropriateness by ----------
Ms. POORNIMA., M.A., B.Ed., M.Phil.

Poornima.M

Date : 01.02.2016

Signature

Address:

Shanthinikethan Matriculation
Higher Secondary School
2nd Main Road, Sembakkam,
Chennai - 600 073.

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

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Ms. POORNIMA., M.A., B.Ed., M.Phil.

Poornima.M

Date : 01.02.2016

Signature

Address:

Shanthinikethan Matriculatior
Higher Secondary School
2nd Main Road, Sembakkam,
Chennai - 600 073.

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No. 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Mrs. JEGANATHAN RAJESWARI,
M.Sc., (Nursing),
College of Nursing,
Madras Medical College,
Chennai – 600 003.

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1. Dr.C.Rajendran, M.D.,	: Chairperson
2. Dr.R.Vimala, M.D., Dean, MMC, Ch-3	: Deputy Chairperson
3. Prof.B.Kalaiselvi, M.D., Vice-Principal, MMC, Ch-3	: Member Secretary
4. Prof.R.Nandhini, M.D., Inst.of Pharmacology, MMC	: Member
5. Prof.K.Ramadevi, Director i/c, Inst.of Biochemistry, MMC	: Member
6. Prof.Saraswathy, M.D., Director, Pathology, MMC, Ch-3	: Member
7. Prof.S.G.Sivachidambaram, M.D., Director i/c, Inst.of Internal Medicine, MMC	: Member
8. Dr.Raghumani, M.S., Professor of Surgery, MMC	: Member
9. Thiru S.Rameshkumar, Administrative Officer	: Lay Person
10.Thiru S.Govindasamy, B.A., B.L.,	: Lawyer
11.Tmt.Arnold Saulina, M.A., MSW.,	: Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the tool constructed by Ms.Jeganathan Rajeswari M.Sc. Nursing II year, College of Nursing, Madras Medical College which is to be used in her study titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMOUNG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHOOLAI".**has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

V. Ebigolda

SIGNATURE WITH SEAL

NAME : EBIGOLDA MARY.V

DESIGNATION: READER

COLLEGE : MADHA COLLEGE OF NURSING

MADHA COLLEGE OF NURSING
15 JUL 2015
CHENNAI - 600 069

PLACE: KUNRATHUR

DATE: 15-07-2015

From

Deputy Commissioner (Health)
Public Health Department
Corporation of Chennai
Ripon Building, Chennai-600003

To

The Principal,
College of Nursing,
Madras Medical College,
Chennai-600003

HD.Roc.No.C1/ 4158/2015 Dt. 23.07.2015

Dear Madam,

Sub: Corporation of Chennai-Public Health Department-College of Nursing-Madras Medical College - Requesting permission for MSc-II year Nursing students study proposed at community area Choolai, Chennai- permission orders issued - regarding.

Ref: Your Letter Dt.07.07.2015.

With reference cited above, the Corporation of Chennai is happy to grant you permission to a study to evaluate the following subjects in selected urban area at choolai.

S.No.	NAME OF THE STUDENT	DISSERTATION TOPICS
1	Jaganathan Rajeswari	A study to assess the efectioveness of holy basil leaves extract in reducing blood sugar amoung diabetes mellitus clients in selected urban area at Choolai.
2	Ramya.A	A study to evaluate the effectiveness of amla juice with honey in the control of bloold pressure among hypertensive client in seleted urban areat at Choolai
3	Sangeetha.V	A study to assess the effectiveness of soya milk with honey consumption on reducing physical and physiological symptoms amoung the post-menopausal women with in age group 40-60 years at Choolai
4	Visithra J	A study to assess and compare the effectiveness of fenugreek leaves with elemental iron and elemental alone on anemia among women residing in selected community at Choolai.

The permission for the study is granted with the following conditions.

1. The study should be conducted as per the request. The study should be conducted in one month, from the date of permission.
2. The Corporation of Chennai will not provide any monitory or human resources support for the study.
3. The details of the study should be submitted to the City Health Officer (i/c), Corporation of Chennai by the candidates before any formal publication.
4. No wrong reporting of Corporation of Chennai should be carried out.

Best wishes,

For Deputy Commissioner (Health) 2/2

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the tool constructed by Ms.Jeganathan Rajeswari M.Sc. Nursing II year, College of Nursing, Madras Medical College which is to be used in her study titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF HOLY BASIL LEAVES EXTRACT IN REDUCING BLOOD SUGAR AMONG DIABETES MELLITUS CLIENTS IN SELECTED URBAN AREA AT CHOOLAI".**has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

SIGNATURE WITH SEAL

Director
Institute of Community Medicine
Madras Medical College & RGGGH
Chennai- 600 003.

NAME : Dr. JOY PATRICIA PUSHPARANI, M.D.

DESIGNATION: Professor and H.O.D of community Medicine

COLLEGE : Madras Medical college, Chennai-03.

PLACE: Chennai-03.

DATE: 13.07.15

RESEARCH TOOLS

INSTRUCTION:

- ❖ Please be frank and free in answering the question.
- ❖ Read each item carefully and answer all the questions.
- ❖ Answers will be used only for research purpose and will be confidential.
- ❖ Please put a tic mark at the appropriate option.

SECTION-A DEMOGRAPHIC PROFILE

1. Age

a. 40-45yrs . ☐

b .46-50yrs ☐

c. 51-55yrs ☐

d. 56-60yrs ☐

2. Sex

a. Male ☐

b. Female ☐

3. Religion

a. Hindu ☐

b .Muslim ☐

c. Christian ☐

d. Others ☐

4. Educational status

a. No formal education ☐

b. Primary ☐

c. Secondary ☐

d. Higher secondary ☐

e. diploma ☐

f. Degree ☐

5. Occupation

a. Home maker ☐

b. Private employee ☐

c. Govt employee ☐

d. self employee ☐

6. Monthly family income

a. <Rs.1589 ☐

b. Rs 1590 - 4726 ☐

c. Rs 4727 - 7877 ☐

d. Rs 7878 - 11816 ☐

F.> Rs 11816 ☐

7. Dietary habits

a. Vegetarian ☐

b. Non vegetarian ☐

If Non – Vegetarian mention the frequency

a. Weekly once ☐

b. Weekly twice ☐

c. Monthly once ☐

d. Monthly twice ☐

8.Do you perform any exercise?

a. Yes ☐

b. No ☐

If yes what type of exercise?

a. walking ☐

b. cycling ☐

c .Yoga ☐

d. others ☐

9. Knowledge regarding benefit of Tulsi

Useful for

a. Resp problem ☐

b. Gastric problem ☐

c. Improve Immunity ☐

d. Only Religious ☐

SECTION –B : MEDICAL RELATED INFORMATION

1**.Family history of diabetes mellitus**

a. Yes ☐

b. No ☐

If yes mention the relationship

a. Father ☐

b. Mother ☐

c. Sibling ☐

d. Other specify ☐

2.Duration of illness

a. < 1year ☐

b. 1-3 years ☐

c. 3-5 years ☐

d. > 5 years ☐

3.What are the symptoms you have experienced before treatment?

a. Giddiness ☐

b. Excessive thirst, hunger, urination ☐

c .Itching in the genital area ☐

d. All the above ☐

e. Not known ☐

4. Duration of treatment

a. < 1year ☐

b. 1-3 years ☐

c. 3- 5years ☐

d. > 5 years ☐

5. Are you on regular treatment?

a. Yes ☐

b. No ☐

6. If yes mention the type of medication

a. Allopathy ☐

b. Siddha ☐

c. Unani ☐

d. Homeopathy ☐

If allopathy specify the drugs

a.Metformin ☐

b. Daonil ☐

c. Glipizide ☐

d. Glimipride ☐

e. Others ☐

7. Mention the experienced hypoglycemic symptoms of the following

a. Giddiness ☐

b. Palpitation ☐

c. Profuse sweating ☐

d. Others ☐

8. Specify the complication of Diabetes Mellitus

a. Eye problem ☐

b. Kidney problem ☐

c. Nerve problem ☐

d. Cardiac problem ☐

e. Foot ulcer ☐

f. CVA ☐

g. Others ☐

BLOOD SUGAR TYPE	PRE TEST VALUE	POST TEST VALUE
FASTING BLOOD SUGAR		

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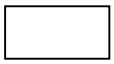
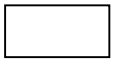
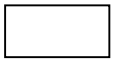
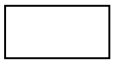
«．þøÄò¾Ãº‹ 

¬．¾É‹Â¡÷Ð¨È 

þ．«Ãº¡í¸§Å¨Ä 

®．ÍÂò¦¾¡Æ‹ø 

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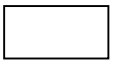
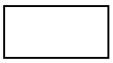
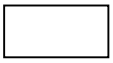
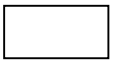
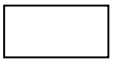
«．<å．1589 

¬．å．1590-4726 

þ．å．4727-7877 

®．å．7878-11816 

¯．å．>11816 

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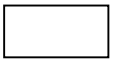
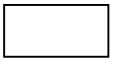
«．¨ºÅ¯½× 

¬．«¨º×¯½× 

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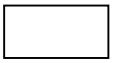
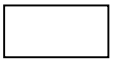
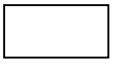
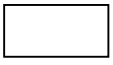
«．Å¡Ãõ´ÕÓ¨È 

¬．Å¡Ãõ þÕÓ¨È 

þ．Á¡¾õ´ÕÓ¨È 

®．Á¡¾õ þÕÓ¨È 

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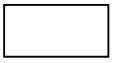
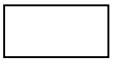
«．¬õ 

¬．þø¨Ä 

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PROCEDURE

PREPARATION OF HOLY BASIL LEAVES EXTRACT

DEFINITION

This is a extract prepared from 15 gms of fresh holy basil leaves added in 50 ml of boiling water.

PURPOSE

To reduce the blood sugar level in Type II diabetic adults.

PREPARATION

Explain the procedure to the client and his family members, and explain about the action of holy basil leaves extract.

SOURCES OF HOLY BASIL LEAVES EXTRACT

15 gms of Holy basil leaves

50 ml of water

PREPARATION OF HOLY BASIL LEAVES EXTRACT

Wash fresh holy basil leaves, and add 50ml of hot water and leave it for 10 minutes. than, filter the extract , and drink after breakfast daily for 14days.

ACTION OF HOLY BASIL LEAVES EXTRACT

Holy basil has been Known to the Ayurvedic medical tradition as tulsi, . The leaf also contains an essential oil composed of eugenol and other volatile compounds. The ethanolic extract ofTulsi leaves lead to marked lowering of blood sugar . Several of these constituents have antioxidant and anti-inflammatory properties,which is very useful in controlling diabetes.

DOCUMENTATION

Record the procedure with date and time.

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±Éì Ì Å¦ÕôÀÁ¦øÄ¡¾Àðºò¾¦ø ¬Ã¡öîº¦Â¦Ä¦ÕóÐ ±ó§¿ÃÓõ Å¦Ä¸Ä¡õ ±ýÀ¨¾Ôõ ÁÕòÐÅ÷ ãÄõ «È¦óÐ ¦¸¡ñ§¼ý.

þó¾ ¬Ã¡öîº¦ ´ôÒ¾ø ¸Ê¾ò¾¦ø ¯ûÇ Å¦ÀÃí¸¨Ç ¿ý Ì Ò¡¦óÐ¦¸¡ñ§¼ý.±ÉÐ ¯¡¦¨Á¸û ÁüÚõ ¸¼¨Á¸û ¬Ã¡öîº¦Â¡Ç÷ ãÄõ Å¦Çì¸ôÀð¼Ð.

¿¡ý ¬Ã¡öîº¦Â¡ÇÕ¼ý ´òÐ¨Æì¸ ºõÁ¾¦ì¸¦§Èý.±Éì Ì ²§¾Ûõ ¯¼ø¿Äì Ì ¨È× ²üÀð¼¡ø ¬Ã¡öîº¦Â¡Ç¡¦¼õ ¦¾¡¦Å¦ô§Àý.

¿¡ý ¦ÅÚ ±ó¾ ¬Ã¡öîº¦Â¦Öõ ¾üºÁÂõ þ¼õ¦ÀÈÅ¦ø¨Ä ±ýÀ¨¾ ¦¾¡¦Å¦òÐì ¦¸¡û¸¦§Èý.

þó¾ ¬Ã¡öîº¦Â¦ý ¾¸Åø¸¨Ç ¦ÅÇ¦Â¦¼ ºõÁ¾¦ì¸¦§Èý.«ôÀÊ ¦ÅÇ¦Â¦Î õ§À¡Ð ±ý «¨¼Â¡Çõ ¦ÅÇ¦ÅÃ¡Ð ±ýÀ¨¾ «È¦§Åý.

±Éì Ì þó¾ ´ôÒ¾ø ¸Ê¾ò¾¦ý ¿¸ø ¦¸¡Î ì¸ôÀð¼Ð.

¬öÅ¡Ç÷ ¨¸¦Â¡ôÀõ

§¾¾¦

Àí§¸üÀ¡Ç÷ ¨¸¦Â¡ôÀõ

§¾¾¦

¬Ã¡öî º¼ ¾Å¸ø ¾¡û

Àí§¸üÀ¡Ç÷ ¦ÀÂ÷ :

¬öÅ¡Ç÷ ¦ÀÂ÷ : ¦ƒ¸ý¿¡¾ý þÃ¡¦ƒŠÅ¡¼

¬Ã¡öî º¼¾¨ÄôÒ : þÃñ¼¡õ Å¨¸ ¿¦¡Æ¼× §¿¡ö ¯ûÇÅ÷¸Ù ì Ì ÐÇº¼
þ¨Ä º¡Ú ¦¸¡Î òÐ þÃò¾ò¾ø ¯ûÇ º ì¸¨ÃÂ¼ý «Ç¨Å
Ì¨ÈôÀ¾ü¸¡É ´÷ ¬ö×.

þó¾ ¬ö× ¦ºý¨É Ý¨ÇÂ¼ø §Áü¦¸¡ûÇôÀ¼ ¯ûÇÐ.
¯í¸¨Ç þó¾ ¬öÅ¼ø Àí§¸ü¸ «¨ÆÌ¸¼ý§È¡õ. ¿¦í¸û þó¾ ¬öÅ¼ø Àí§¸ü¸Ä¡Á¡ «øÄÐ §Å ñ¼¡Á¡ ±ýÀ¨¾ ÓÊ× ¦ºöÂ þó¾ ¬Å½ò¾ø ¯ûÇ ¾¸Åø ¯¾Å¼Â¡¸ þÕì Ì õ. ¯í¸Ù ì Ì ²§¾Ûõ ºó§¾¸õ þÕó¾¡ø ¿¦í¸û ±í¸Ç¼½õ ¦ÅÇ¼À¨¼Â¡¸ §¸ð¸Ä¡õ.
±í¸Ù¨¼Â «ÊôÀ¨¼ ¾Ì¾¸Ç¼ø ¿¦í¸û ¾ÕôÕ¾¼Â¡¸ þÕôÀ¾¡ø ¯í¸¨Ç þó¾ ¬öÅ¼ø Àí§¸ü¸ «¨ÆÌ¸¼ý§È¡õ

¬öÅ¼ý §¿¡ì¸õ ÁüÚõ ¦ºÅøÀ¡Î

¬ö× §Áü¦¸¡ûÅ¾üÌ Óý º ì¸¨Ã §¿¡Â¡Ç¼¸Ù ì Ì ¯½×
±ÎòÐì¦¸¡û Ùõ Óý ÁüÚõ À¼ý º ì¸¨ÃÂ¼ý «Ç× À¡¼§º¡¾¼ì¸ôÀÎõ.
¬ö× §Áü¦¸¡ûÀÅ÷¸û 1 ÁüÚõ 2 ±ýÚ þÃñÎ À¼¡Å¼ÉÃ¡¸ À¼¡ì¸ôÀÎõ. «¾¼ø 1õ À¼¡Å¼ÉÕì Ì Áð Îõ ÐÇº¼ þ¨Ä º¡Ú 50 Á¼.Ä¼ ¾¼ÉÓõ 15 ¾¼Éí¸Ù ì Ì ¦¸¡ÎòÐ Ãò¾ò¾ø º ì¸¨ÃÂ¼ý «Ç¨Å Ì¨ÈôÀ¾ü¸¡É ´÷ ¬ö× §Áü¦¸¡ûÇôÀÎõ.
15 ¿¡ð¸Ù ì Ì À¼È Ì þÕ À¼¡Å¼ÉÕì Ì õ (1 ÁüÚõ 2) º ì¸¨ÃÂ¼ý «Ç× ¯ñÀ¾ü Ì Óý ÁüÚõ À¼ý À¡¼§º¡¾¼ì¸ôÀÎõ. þó¾ ¬ö× þÄÅºÁ¡¸ §Áü¦¸¡ûÇôÀÎõ.
þó¾ ¬öÅ¼ø ¯í¸û ¦ÀÂ÷, ÅÂÐ, þÕôÀ¼½õ, ¯½× Ó¨È ÀüÈ¼Â ¾¸Åø¸¨Ç ¦ÀüÚì¦¸¡û§Å¡õ. þ¾É¡ø ±ó¾Å¼¾ Àì¸ Å¼¨Ç×¸Ù õ ²üÀ¼¡Ð. þó¾ º¸¼î¨º þÄÅºÁ¡¸ ÅÆí¸ôÀÎõ.

º¼Ä ¾¸Åø¸û ¯í¸Ç¼½õ ¦ÀÈôÀÎõ

¯í¸Ù ì Ì ¯í¸Ù¨¼Â ¾¸Åø¸¨Ç þÃ¸º¼ÂÁ¡¸ ¨ÅòÐì ¦¸¡ûÙõ ¯¡¨Á ¯ñÎ ¿¦í¸û þó¾ ¬öÅ¼ø ¨¸¦Â¡ôÀÁ¼ÎÅ¾¡ø ¿¦í¸û ¯í¸Ù¨¼Â ¾¸Åø¸¨Ç ¬ö× ì Ìõ ¿¼ÚÅÉò¾¼¼Óõ ¸¡ð¼ §Å ñ Îõ.
¬Ã¡öî º¼Â¼ý ¾¸Åø¸¨Ç Å¼ï »¡É þ¾ú¸û ÁüÚõ Å¼ï »¡É Ü¼ò¾¼ø ¦ÅÇ¼Â¼¼ôÀð¼¡Öõ ¯í¸Ù¨¼Â «¨¼Â¡Çí¸û ¸¡ð¼ôÀ¼Á¡ð¼¡Ð.

¬öÅ¡Ç÷ ¨¸¦Â¡ôÀõ

Àí§¸üÀ¡Ç÷ ¨¸¦Â¡ôÀõ

§¾¾¼

§¾¾¼

S.NO	AGE	SEX	RELIGION	EDUCATIONAL STATUS	OCCUPATION	MONTHLY INCOME	DIETARY HABITS	FREQUENCY OF N.V	EXERCISE	TYPE OF EXERCISE	BENEFIT OF TULSI	Q 1	Q 1a	Q2	Q3	Q4	Q5	Q6	Q6a	Q7	Q8	pre	post
1	a	b	a	c	a	c	b	a	b		a	a	b	d	c	d	a	a	a,c	a	b	158 mgs	126 mgs
2	a	b	a	c	a	d	b	b	b		d	b		c	e	c	b	a	a	c	a	169 mgs	131 mgs
3	b	a	a	b	b	d	b	b	a	b	a	b		b	b	b	b	a	a	a	e	160 mgs	136 mgs
4	b	b	a	b	d	a	b	a	b		a	b		d	d	d	a	a	a	d	e	154 mgs	139 mgs
5	b	b	a	d	d	c	b	d	b		a	a	c	d	c	d	a	a	a,d	a	f	178 mgs	133mgs
6	b	b	a	b	d	a	a		b		b	b		a	b	a	a	a	a	d	c	179 mgs	140 mgs
7	c	a	a	c	d	f	b	a	b		c	b		d	a	d	a	a	a,c	d	g	164 mgs	136 mgs
8	d	a	a	b	b	c	b	b	b		a	b		d	a	d	a	a	a,d	d	g	161 mgs	128 mgs
9	d	a	a	c	b	b	b	c	b		d	b		d	a	d	a	a	a,c	a,b	e	175 mgs	140mgs
10	a	b	a	c	d	b	b	c	b		a	b		d	e	d	a	a	a,c	d	a,c	159 mgs	130 mgs
11	c	b	a	c	a	b	b	b	b		a	a	b	c	c	c	a	a	a,c	a,b	a,f	148 mgs	121 mgs
12	d	a	a	b	d	d	b	a	a	a	a	b		b	a	b	a	a	a	c	a	168 mgs	146 mgs
13	b	a	c	b	b	c	b	b	a	a	d	b		b	b	b	b	a	a	d	f	155 mgs	149 mgs
14	c	a	a	c	c	d	b	b	a	a	d	a	c	c	e	c	a	a	a,c	d	b	146 mgs	129 mgs
15	c	b	a	c	a	d	a		a	a	a	a	c	d	b	c	a	a	a	c	f	132 mgs	120 mgs
16	d	a	b	c	d	c	b	a	b		a	b		d	a	d	a	a	a,c	d	b	148 mgs	129 mgs
17	b	a	a	c	d	d	b	b	a	a	b	a	a	d	e	d	a	a	a,b	a	g	164 mgs	140 mgs
18	b	b	a	b	a	c	b	b	b		c	a	b	c	a	c	a	a	a	d	a	160 mgs	141 mgs
19	a	b	b	c	a	d	b	b	b		a	a	a	d	c	d	a	a	a,d	a	f	167 mgs	136 mgs
20	a	b	a	c	a	d	b	a	b		b	a	b	b	a,c	b	a	a	a,d	c	b	140 mgs	123 mgs
21	b	b	a	a	a	c	b	c	b		d	a	c	d	a	d	a	a	a,d	d	d	176 mgs	147 mgs
22	c	b	a	c	a	a	b	c	b		a	b		d	a	d	b	a	a	a	g	156 mgs	131 mgs
23	b	b	a	b	a	c	b	b	a	a	d	b		a	e	a	a	a	a	a	e	161 mgs	132 mgs
24	d	a	a	f	d	f	b	a	a	a	a	a	a	d	a	d	a	a	a,d	d	f	179 mgs	150 mgs
25	c	a	c	b	b	d	b	b	b		a	b		c	b	c	b	a	a,d	a,c	e	163 mgs	147 mgs
26	b	b	a	f	c	f	a		a	a	c	b		d	a,c	d	a	a	a,d	a,c	a,e	180 mgs	176 mgs
27	d	a	a	c	b	d	b	b	a	a	a	a	a	d	a	d	a	a	a,d	a	e	178 mgs	171 mgs
28	a	a	a	f	c	f	b	a	b		a	a	a	d	b	d	a	a	a,c	b	a	169 mgs	168 mgs
29	d	b	a	c	a	d	b	b	b		a	a	b	b	c	b	a	a	a,d	c	d	159 mgs	160 mgs
30	d	b	a	d	a	d	b	b	b		d	a	b	d	b	d	a	a	a	d	d	149 mgs	152 mgs
	CONTROL	GROUP																					
1	c	b	a	b	a	c	b	b	b		a	a	a	a	a	a	a	a	a	a	a	170 mgs	172 mgs
2	c	b	a	a	d	c	a		b		c	a	a	d	c	d	b	a	a	a,c	e	178 mgs	177 mgs
3	d	b	a	b	d	b	a		b		a	b		c	a	c	b	a	a	a	c	160 mgs	157 mgs
4	d	a	a	c	c	f	b	b	a	a	a	b		d	b	d	a	a	a,c	c	e	156 mgs	159 mgs
5	b	a	a	e	b	d	b	a	b		a	a	a	d	a	d	a	a	b	a,c	e	150 mgs	149 mgs
6	d	a	b	c	d	c	b	a	b		a	b		d	a	d	a	a	a	d	b	148 mgs	144 mgs
7	b	a	a	c	d	d	b	b	a	a	b	a	a	d	e	d	a	a	a,b	a	g	163 mgs	165 mgs
8	b	b	a	b	a	c	b	b	b		c	a	b	c	a	c	a	a	a	d	a	152 mgs	154 mgs
9	a	b	b	c	a	d	b	b	b		a	a	a	d	c	d	a	a	a,d	a	f	148 mgs	162mgs
10	a	b	a	c	a	d	b	a	b		b	a	b	b	a,c	b	a	a	d	c	b	156 mgs	159mgs
11	b	b	a	a	a	c	b	c	b		d	a	c	d	a	d	a	a	a,d	d	d	151mgs	172 mgs
12	a	b	a	c	a	c	b	a	b		a	a	b	d	c	d	a	a	b	a	b	160 mgs	132 mgs
13	a	b	a	c	a	d	b	b	b		d	b		c	e	c	b	a	a	c	a	167 mgs	156 mgs
14	b	a	a	b	b	d	b	b	a	b	a	b		b	b	b	b	a	a	a	e	174 mgs	151mgs
15	b	b	a	b	d	a	b	a	b		a	b		d	d	d	a	a	a	d	e	180 mgs	161 mgs
16	b	b	a	d	d	c	b	d	b		a	a	c	d	c	d	a	a	a,d	a	f	138 mgs	131 mgs
17	b	b	a	b	d	a	a		b		b	b		a	b	a	a	a	a	d	c	145 mgs	147 mgs
18	c	a	a	c	d	f	b	a	b		c	b		d	a	d	a	a	c	d	c	159mgs	160 mgs
19	d	a	a	b	b	c	b	b	b		a	b		d	a	d	a	a	a,d	d	g	163mgs	172 mgs
20	d	a	a	c	b	b	b	c	b		d	b		d	a	d	a	a	a,c	a,b	e	157 mgs	159 mgs
21	a	b	a	c	d	b	b	c	b		a	b		d	e	d	a	a	a,c	d	c	141 mgs	146mgs
22	c	b	a	c	a	b	b	b	b		a	a	b	c	c	c	a	a	a	b	a,f	170 mgs	165mgs
23	d	a	a	b	d	d	b	a	a	a	a	b		b	a	b	a	a	a	c	a	177mgs	172mgs
24	b	a	c	b	b	c	b	b	a	a	d	b		b	b	b	b	a	a	d	f	139 mgs	145mgs
25	c	a	a	c	c	d	b	b	a	a	d	a	c	c	e	c	a	a	a,c	d	b	162 mgs	150 mgs
26	c	b	a	c	a	d	a		a	a	a	a	c	d	b	c	a	a	a	c	f	158 mgs	155mgs
27	d	a	a	c	b	d	b	b	a	a	a	a	a	d	a	d	a	a	a,d	a	e	164 mgs	160 mgs
28	a	a	a	f	c	f	b	a	b		a	a	a	d	b	d	a	a	a,c	b	a	175 mgs	179 mgs
29	d	b	a	c	a	d	b	b	b		a	a	b	b	c	b	a	a	a,d	c	d	149 mgs	151mgs
30	d	b	a	d	a	d	b	b	b		d	a	b	d	b	d	a	a	a	d	d	168 mgs	164 mgs